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THE

RETROSPECT

OF

PRACTICAL MEDICINE & SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

Edited by

W. BRAITHWAITE,

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SYNOPSIS.—INDEX.

PRACTICAL MEDICINE,

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

Art. 1.—ON THE PATHOLOGY OF SIMPLE, CANCEROUS, AND TUBERCULAR EXUDATIONS.—By Prof. Bennett, Edinburgh.

[Dr. Bennett, in a most valuable paper in the Edinburgh Monthly Journal, describes the three varieties of "exudation," *simple*, *cancerous*, and *tubercular*, as occasioning the great majority of diseases; and directs attention to a knowledge of these as constituting "the foundation of modern rational medicine." He says,]

The term exudation has been introduced into pathology, not only to express the act of the liquor sanguinis passing through the vascular walls, but to denominate the fibrinous portion of the liquor sanguinis itself, when it has coagulated on the surface, or in the substance of any tissue or organ of the body. This term meets a difficulty which morbid anatomists have long experienced; and hence it has of late years been extensively used to signify various kinds of morbid deposits. Thus it has been applied to all those processes hitherto termed inflammatory, tubercular, and cancerous; to all kinds of tumour and morbid growth, and what has been called melanosis and typhous deposit. It is often the cause of many concretions, and frequently constitutes the soil for parasitic vegetations or cryptogamic plants of a low type, which communicate essential characters to certain diseases. Indeed exudation, as a morbid process, comprises the greater part of organic, as distinguished from functional diseases, of lesions of nutrition, as separated from lesions of innervation.

I. Early Phenomena of Exudation.—Exudation in every case results from a previous series of changes which has taken place in the capillary vessels and blood contained in them. These changes, as we are enabled to follow them in the transparent parts of animals under the microscope, are seen to occur in the following order:—1st, The capillary vessels are narrowed, and the blood flows through them with greater rapidity. 2d, The same vessels become enlarged, and the current of blood is slower, although even. 3d, The flow of blood becomes irregular. 4th, All motion of the blood ceases, and the vessel appears fully distended. 5th and lastly, The liquor sanguinis is exuded through the walls of the vessel, sometimes accompanied by extravasation of blood corpuscles, owing to rupture of the capillaries.

The first step in the process, viz., narrowing of the capillaries, is readily demonstrated on the application of acetic acid to the web of the frog's foot. If the acid be weak, the capillary contraction occurs more slowly and gradually. If it be very concentrated, the phenomenon is not observed, or it passes so quickly into complete stoppage of blood, as to be imperceptible. Although we cannot see these changes in man under the microscope, certain appearances indicate that the same phenomena occur. The operations of the mind, for instance, as fear and fright, and the application of cold, produce paleness of the skin; an effect which can only arise from contraction of the capillaries, and a diminution of the quantity of blood they contain. In the majority of instances, also, this paleness is succeeded by increased redness, the same result as follows from direct experiment on the web of the frog's foot, constituting the second step of the process. In other cases, the redness may arise primarily from certain mental emotions, or from the application of heat. In either case it depends on the enlargement of the capillaries, and the greater quantity of blood they contain.

The variation in the size of, and amount of blood in, the capillaries, is conjoined with changes in the movement of that fluid. Whilst the vessels are contracted, the blood may be seen to be flowing with increased velocity. After a time the blood flows more and more slowly, without, however, the vessel being obstructed: it then oscillates, that is, moves forwards and backwards, or makes a pause, evidently synchronous with the ventricular diastole of the heart. At length the vessel appears quite distended with yellow corpuscles, and all movement ceases.

Again, these changes in the movement of the blood induce variations in the relation which the blood corpuscles bear to each other, and to the walls of the vessel. In the natural circulation of the frog's foot, the yellow corpuscle may be seen rolling forward in the centre of the tube, whilst on each side a clear space is left, only filled with liquor sanguinis, and a few lymph corpuscles. There are evidently two currents, the centre one very rapid, and that at the sides (in the lymph spaces, as they are called) very slow. The coloured corpuscles are hurried forward in the first, occasionally mixed with some lymph corpuscles. These latter, however, may frequently be seen clinging to the sides of the vessel, or slowly proceeding a short distance down the tube in the lymph space, and then again stopping. Occasionally they get into the central torrent, when they start off with great velocity, and accompany the yellow corpuscles. It has been said that these corpuscles augment in number, accumulate in the lymph spaces, and obstruct the flow of blood. In young frogs, their number is often very great; but then they constitute a normal part of the blood, and in no way impede the circulation. In old frogs, on the other hand, all these, and subsequent changes, may be observed, without the presence of colourless corpuscles. When the capillaries enlarge, however, the central coloured column in the smaller vessels may be seen to enlarge also, and gradually approach the sides of the tube, thus encroaching on the lymph spaces. The slower the motion of the blood, the closer it comes, until at length the coloured corpuscles come in contact with the sides of the vessel, and are more or less compressed and changed in form. At length the vessel is completely distended with coloured corpuscles, the original form of which can no longer be discovered, and the tube appears to be filled with a homogeneous deep crimson fluid. This is congestion. If the morbid process continue, the vessel may burst, causing hemorrhage, or the serum and liquor sanguinis may transude through its walls, without rupture, into the surrounding texture. This is exudation.

II. Theory of exudation.—It is of the utmost importance in pathological inquiries to separate facts from theories. Our facts may be correct, although the conclusions derived from them are wrong. This proposition, however generally admitted, is seldom acted on in medical inquiries, in which we find fact and hypothesis so mingled together, that it often requires considerable critical and analytical power to separate one from another. We are, however, in all cases, insensibly led to theorise—that is, to attempt an explanation of the phenomena observed, in order that we may derive from them some general principle for our guidance. Such speculation is always legitimate, so long as we consider opinions to be mere generalizations of known facts, and are ready to abandon them the moment other facts point them out to be erroneous. The phenomena of exudation, previously described, may easily be demonstrated—they constitute the *facts*. Let us now examine how they have been attempted to be explained—in other words, what is the *theory*.

1. The contraction and dilation of the capillaries is explicable, by sup-

posing them to be endowed with a power of contractility analagous to that existing in non-voluntary muscles. John Hunter thought they were muscular, from the results of his observations and experiments; and they may be shown by the histologist to consist of a delicate membrane, in which permanent nuclei are imbedded. In structure, then, they closely resemble the muscular fibres of the intestine, and we know that, like them, they may be contracted or dilated by emotions of the mind, or by local applications. The narrowing of these tubes, therefore, may be considered, as Cullen thought it was, analagous to spasm, while their dilatation is similar either to the relaxation which follows such spasm, or to muscular paralysis.

2. The rapid and slow movement of the blood is explicable on the hydraulic principle, that when a certain quantity of fluid is driven forward with a certain force through a tube, and the tube is narrowed or widened, while the propelling force remains the same, the fluid must necessarily flow quicker in the first case and slower in the second. It has been supposed, from the throbbing of large vessels leading to congested parts, that they pump a larger quanity of blood than usual into them. This was called "determination of blood,' by the older pathologists, but is now known not to be a cause, but a result, of the changes going on in the capillary vessels. The oscillatory movement, seen in the transparent parts of small animals, has not been seen to exist in man, and probably depends, in the former, on a weakened power of the heart.

3. It is the stoppage of the blood, and exudation of the liquor sanguinis, however, which it is most difficult to explain; for why, so long as there is no mechanical obstruction (and during this process none has ever been seen) should the circulation through the capillaries of a part cease? It has been endeavored, indeed, of late years, to establish a mechanical obstruction, by supposing the formation of colourless corpuscles, in large numbers, which *cling to the sides of* the capillaries, and so cause interruption of the stream. But this hypothesis is negatived by the following facts:—1st, In young frogs the vessels may be seen to be crowded with colourless corpuscles, while the circulation is in no way affected. 2d, In old frogs, oscillation and gradual stoppage of the stream may be seen, without any colourless corpuscles being present. 3d, The colourless corpuscles, as shown by Remak, are increased, after large venesections, in the horse, without ever causing active congestion. And 4th, Cases have occurred in man, where all vessels have been crowded with colourless corpuscles, associated with hypertrophied liver and spleen, and yet no active congestion in these vessels, nor exudation of any kind, has been occasioned.

We cannot ascribe the stoppage of the circulation in the capillaries to venus obstruction, or to mechanical pressure of any kind, because all observation proves that such causes, while they induce effusion of serum, never occasion exudation of liquor sanguinis. We are compelled, therefore, to ascribe the vital force producing these changes, not to anything residing in the blood, or in the vessels, but to the tissues which lie outside the vessels. Whether we give to this force the name of attraction, or whether we consider it a modification of the power which, in a state of health, attracts nutritive materials from the blood, is of little consequence—such seems to be the only active agency to which we can ascribe the approach of the coloured particles to the capillary walls, and the passage through them of the exudation.

III. Resulting Phenomena of Exudation.—When the liquor sanguinis is exuded, it generally coagulates, and constitutes a foreign body in the texture of the parts affected, which it becomes the object of nature either to remove from the system, or so to modify that its presence may be rendered conducive to the wants of the economy. In order to accomplish this, two kinds of changes may take place—1st, The exudation serves as a blastema, in which new vital structures originate and are developed; 2d, It exhibits no power of becoming organised, and the exuded matters, together with the textures involved in them, die. In the former case corpuscles spring up in the exudation, which differ in form, size, constitution, and power of further developement, and give rise to those various appearances and changes which in some cases have been denominated the result of inflammation, in others various kinds of deposits.

We find that the peculiar constitution of the blood, or the general vital power of the organism, exercises a very powerful influence on the development of the exudation. This has been long recognised by pathologists in certain conditions, denominated respectively diathesis, dyscrasia, or cachexia.

1. *Simple Exudation* presents four principle forms—(*a*) As it occurs on serous membranes, when it exhibits a finely fibrous structure, and has a strong tendency to be developed in molecular fibres; (*b*) As it occurs on mucous membranes, or in areolar tissues, when it is generally converted into pus corpuscles; (*c*) When it occurs in dense parenchymatous organs, such as the brain, where it assumes a granular form, and is associated with numerous compound granular corpuscles; (*d*) As it is poured out after wounds or injuries, and occurs on granulating sores. In these cases, the superficial portion is transformed into pus corpuscles, while that deeper seated is converted, by means of nuclei and cells, into nucleus and cell-fibres, which ultimately form the cicatrix.

2. *Cancerous Exudation* presents three principal forms, which are dependant on the relative amount and arrangement of the cells and fibres formed in it. (*a*) The structure is very hard, and is principally formed of fibres (*scirrhus*). (*b*) The structure is soft, containing a copius milky fluid, in which numerous corpuscles swim (*encephaloma*). (*c*) The structure has a fibrous basis, so arranged as to form areolœ or loculi, containing a gelatinous gum or glue-like matter (*colloid cancer*).

(*a*) *Scirrhus* presents to the naked eye a whitish or slightly yellowish tinge; is dense and hard to the feel, and offers considerable resistance to, and often crunches, under the knife. On making a thin section of the growth, it seems to be principally composed of filaments, which vary in size, and run in different directions, sometimes forming waved bands, at others an inextricable plexus, among which, however, nucleated cells may be seen to be infiltrated. Occasionally the fibrous structure forms loculi or cysts, enclosing similar cells.

The so-called *cancer cells* may be round, oval, caudate, spindle-shaped, oblong, square, heart-shaped, or of various indescribable forms, from pressure on their sides. In size they may vary from the 1-100th to the 1-10th of a millimetre in diameter; but in scirrhus they usually measure from the 1-50 to the 1-30th of a millimetre in diameter. The cell wall, when young, is smooth and distended; when old, it is more or less corrugated and flaccid. Each cell contains at least one nucleus, often two, and sometimes they increase in number from three to nine. Most commonly there is only one, which is round or oval, generally the latter, and contains one or two granules or nucleoli. The nucleus, like the cell itself, varies in size, and may occupy from one-sixth to four-fifths of its volume; between the nucleus and cell-wall there is a colourless fluid, which, at first transparent, becomes afterwards opalescent, from the presence of molecules and granules. On the addition of water, the cell becomes distended by edomosis, and is enlarged. When acetic acid is added, the cell wall is rendered more transparent, and in young cells is entirely dissolved, whilst the nucleus on the other hand either remains unaffected, or its margin becomes thicker, and its substance more or less contracted.

(*b*) *Encephaloma* also presents a fibrous texture, which, however, is very loose when compared with that of the scirrhus. In the denser parts of the growth, indeed, it closely resembles that form of cancer; but where it is pulpy and broken down, often no traces of fibres, or at most some fragments of them, are visible.

The whitish cut surface is often more or less mottled with with a greyish, pinkish, yellowish, or black color. The two first are owing to different degrees of vascularity. The reddish spots are owing to extravasations of blood, of greater or less extent; and these, when very large, constitute what has been called by some surgeons *fungus hoematodes*. The yellowish color, when it surrounds bloody extravasations, is owing to imbibition of their coloring matter; but when reticulated over the surface, or collected in masses, it is generally dependent on fatty degeneration of the cancerous tissue, and forms the cancer reticulare of Muller. The yellow matter is usually of cheese-like consistence, friable, and often resembles tubercle, for which it has been mistaken. The blackish tinge is owing to black pigment which may be infiltrated among the cancerous elements, and exist within the cells, constituting the malignant melanosis, or melanic cancer of authors.

A small portion of the cream-like fluid, examined with a microscope, always presents a large number of the cancer-cells formerly described, which in some specimens of encephaloma reach a higher degree of developement than in other forms of cancerous growth. These are mingled with a large number of molecules and granules, compound granular cells, blood corpuscles, and more or less of the fibrous element. The fibrous structure is the same as that in scirrhus, but the filaments are often finer and always more widely separated; while the pulpy matter and cells contained in the interstices are correspondingly increased. The yellow reticulum is sometimes composed of loose granules and compound granular cells, at others, of granules alone. Not unfrequently it contains nuclei, disintegrated and altered in shape. In some instances the encephaloma is more or less impregnated with irregular masses of mineral matter, and occasionally almost entirely converted into a calcareous substance.

(c) *Colloid cancer* consists of a fibrous structure so arranged as to form areolæ or loculi, which are filled with a grey or amber colored glutinous matter, sometimes transparent, at others opalescent or semi-opaque. This matter is occasionally found quite structureless, or exhibits only a finely molecular appearance. Under these circumstances the term *colloid tissue* has been applied to it. At other times numerous nucleated cells, presenting all the characters of cancer cells, in various stages of development, are found in it as a blastema; and we observe that the growth has a tendency to spread. This is colloid cancer, which, when it is formed on a free surface, as on the peritoneum, often presents small grains of a grey color, resembling coagulated gum-arabic. When collected in masses, they have an irregular nodulated aspect. I have never seen the fibrous structure of colloid contain permanent nuclei, or afford any evidence of being developed from nuclei or cells.

All the forms of cancer now described are vascular, but in different degrees. Scirrhus is least so, but is still rich in blood vessels. Encephaloma is always very vascular, and often to such a degree, that it readily bleeds during life—(*fungus hæmatodes*). Colloid cancer is also well supplied with vessels, which ramify among the fibrous tissue. I have already stated that these forms pass into each other, and need only remark here, that this is often so gradual in many specimens, as to render their classification with either very difficult. This is especially the case with scirrhus and encephaloma.

3. *Tubercular Exudation* has been spoken of as presenting a miliary, infiltrated, or encysted form; but these distinctions have no reference to structure, but merely to the extent and age of the exudation. It generally presents a yellowish or dirty-white colour, and varies in consistence from a substance resembling tough chæese to that of cream. Sometimes it is soft at one place, and indurated at another. On section, when tough, it presents a smooth or waxy, and when soft, a slightly granular surface. On pressure it is friable, and may break down into a pulpy matter, but never yields a milky juice.

IV. **Pathology of three kinds of Exudation.**—We have seen that the liquor sanguinis transudes through the coats of the capillaries, and, coagulating outside the vessels, constitutes an exudation more or less solid. Much of the serum which accompanied it is rapidly absorbed, but what remains constitutes a blastema, which becomes, as has been described, organised in various ways, according to the seat and nature of the exuded matter. In simple exudation we observe differences according as it is poured out on a serous, mucous, or granulating surface, or into a dense parenchyma. These differences are certainly owing to the seat of the exudation. But in cancerous or tubercular exudations we observe no such distinctions, although it has been observed that fibrous cancer or scirrhus is most common in fibrous organs, and cell cancer or encephaloma is most common in cellular organs. The most important characters of the three kinds of exudation may be shortly stated as follows:—

We observe in a simple or inflammatory exudation, that it may occur at all epochs in life; that it may attack all tissues, and most commonly those which are very vascular; that it may be poured out in large or small quantities; and that it may occur with greater or less rapidity—hence the terms acute and chronic. We further observe, that the acute exudations are generally attended with symptoms of a peculiar character (inflammatory), and have a great tendency to cell or temporary formations, which rapidly break down, are absorbed and excreted by the emunctories: that the chronic exudations, on the other hand, have a tendency to fibrous or permanent formations, producing adhesions, strictures, hypertrophies, &c.

We observe, in a cancerous exudation, that it occurs for the most part in persons of adult or advanced life; that it may also occur in all tissues, but is by far most common in glandular or fatty organs, such as the liver or female mamma, and is very apt to attack the lymphatic glands *secondarily*; that its progress, although sometimes slow when very fibrous, becomes rapid when corpuscles abound in it; that there is a great tendency to the formation of most perfect forms of cell life, which have the power of self-development, and thereby spreading to neighbouring tissues; and lastly, that when, pressure, ulceration is produced on free surfaces, it bursts through these in exuberant fungoid excrescences.

We observe, in a tubercular exudation, that it occurs for the most part in young subjects, between the periods of dentition and of adult age; that it may occur in all tissues, but is by far most common *primarily* in the lymphatic glands, and afterwards in fibrous or albuminous textures, as the lungs and serous sufaces; that its progress is generally exceedingly slow, that there is no tendency to perfect cell formation, but rather to abortive corpuscles, which form slowly, and slowly break down; that there is little tendency to absorption, but great liability to disintegration and ulceration; and finally, that the local changes are almost always preceded by derangement of the primæ viæ, and a group of symptoms known under the name of dyspepsia.

Taking, then, the products of simple inflammation (say pus) as a standard, we cannot fail to remark, that whilst the cell development of tubercle is below, that of cancer is above, this standard. Of the three kinds of exudation, tubercle is the lowest, and cancer the highest, in the scale.

On what this difference in the formative power of the exudation depends, we are ignorant, but every kind of reasoning must lead us to the conclusion, that these different changes and effects depend not upon the vascular system, which is the mere apparatus for the production of exudation; not upon the nervous system, which leads to the necesssary arrangement of that apparatus for the purpose; and not on the texture, which is the seat of the exudation, as that varies, whilst the cancerous or tubercular formation is the same—but in the inherent composition or constitution of the exudation itself. On this point most pathologists are agreed, and hence the supposed existence of various kinds of dyscrasiæ, originating in the blood, which it is imagined explain the different results produced. But here pathologists pause—once traced back to the blood, they are content; and they have not sufficiently taken into consideration, that the blood itself is dependent for its constitution on the results of the primary digestion in the alimentary canal on the one hand, and the secondary digestion in the tissues on the other. Yet it must be evident to every physiologist, that if it be the constitution of the blood which determines the constitution of the exudation, the causes which produce this must be sought in those circumstances which operate on the composition of the former fluid.

Now, numerous facts, to which I shall allude on some future occasion, render it probable that while the blood is normal in simple exudation, it contains an excess of nutritive materials in cancerous, and a deficiency of them in tubercular, exudation. These are points, however, which can only be established after examining instances of such exudations in detail. But it must not be forgotten, in the meantime, that as the blood is continually undergoing changes, is receiving and giving off new matters, it can scarcely happen that it remains the same for many hours together. An exudation at one time may be very different from that at another. At one period it may abound in elements which do not exist in it at the next. Hence it may often happen that a concurrence of circumstances is necessary to occasion a certain result. A cancer once formed, may remain local until such a concurrence of events arises, comprising, first, a peculiar constitution of the blood, secondly, the phenomena leading to and producing an exudation, and thirdly, the occurrence of this exudation in some other tissue or organ sufficiently predisposed for the purpose. Hence why the histologist is continually finding all kinds of intermediate formations between the three leading kinds of exudation, and why, even when the constitution is thoroughly cancerous or tubercular, simple exudations may be poured into tissues as the result of recent wounds or injuries.

The final termination of either kind of exudation may be the same, only each has its peculiarities. We have noticed the tendencies of simple exudation to be transformed into pus or fibres, according to its seat. In the former case, the pus cells break down, and are re-absorbed in a disintegrated and fluid condition into the blood; in the latter, permanent fibrous tissue is produced, constituting chronic adhesions or cicatrices. The cells of a cancerous growth may also degenerate or decay, but this rarely takes place throughout the whole structure. But it is not uncommon to find in certain encephalomatous tumours, yellow matter either in masses or reticulated through its substance—(*Cancer Reticulare of Muller.*) This is generally owing to fatty degeneration of the cancer cells. The fibrous structure of cancer may also increase, and occasionally produce cicatrization. Tubercle possesses no such fibrous stroma, which is almost always vascular. This, indeed, is the reason why a cancerous tumour increases by growth, which tubercle cannot be said to do; the former is vascular, the latter is not: in the one, cells are formed which have the power of re-development, in the other, no re-productive cells are produced. In cancer the morbid matter circulating in the blood (whatever that is,) is concentrated or attracted to the cancerous part, and should none afterwards be present, the healthy blood is made subservient to the purpose of nourishing a foreign growth. In tubercle successive fresh exudations only are made, which by their accumulation, augment the volume or amount of the morbid product.

All three forms of exudation may be rendered abortive by the animal matter being broken down and absorbed, while the mineral matter remains, constituting a cretaceous or calcareous concretion. This is not unfrequently seen as the result of simple exudation; is rare in cancerous, but very common in tubercular exudation.

During the disintegration of simple, cancerous, and tubercular exudations, the animal matter broken down is again rendered fluid, re-passes into the blood, and then constitutes that excess of fibrine detected by chemists. The amount of this, will, of course, vary according to the amount of the exudation and the activity of the disintegrating process. In the blood this effete matter probably undergoes chemical changes, preparatory to its excretion by the different emunctories, but more especially by the kidneys in the form of various sediments. The resolution of simple exudation is generally accompanied by the presence of such urinary sediments, which indicate pretty clearly in what way, after it has passed through the phases of development described, it is at length discharged from the body. In the same manner the amount of these sediments frequently points out the extent of absorption going on in cancerous and tubercular exudations.

[Dr. Bennett refers the general treatment of exudation, as founded on these doctrines, to three indications: viz. 1st. To prevent or diminish the extent of an exudation; 2. When it has coagulated, to further its removal from the economy; or, 3. If this cannot be accomplished, to render its products as little injurious to the system as possible.]—*Monthly Journal, Feb.* 1850, *p.* 149.

2.—NEW TREATMENT OF CANCER.

Some curious experiments are now going on under the superintendence of the Medical Society of Paris, and relative to Dr. Tanchou, who for many years has professed to cure cancer and several other intractable diseases.

On the 8th of March last, Dr. Tanchou presented two patients to the Society, and requested the members to examine them. They did so, but strange to say, no two members could agree as to the real nature of the disease; nor would Dr. Tanchou, himself, undertake to pronounce a diagnosis. He merely affirmed, that they were cases of a "mauvaise nature." However this may be, the Doctor proceeded to treat the patients after his own fashion, and again presented them to the Society on the 6th ult. One of the patients had an open sore on the chin, which some said was cancer, others lupus. The second patient laboured beyond all doubt under open cancer of the mamma, and was, moreover, in a very bad state of health. Dr. Tanchou brought back the first patient cured. As to the second one, the ulcer of the breast was nearly healed; the cancerous diathesis had disappeared, and the patient had become fat. These were incontestible facts, and it may be worth while to relate how such results were obtained, although the worthy practitioner's treatment smells strongly of the charlatan. The treatment of the lupus patient lasted three months and a-half. It consisted in a substantial diet, and frequent exercise in the open air. These were aided by a great variety of remedial means; first, tincture of iodine, then Fowler's solution, and then arsenic and iodine alternately. The sore was occasionally washed with tar-water, tincture of iodine, decoction of poppies, &c., and finally cauterized with nitrate of silver, creosote, and iodine. The cicatrix is now sound and healthy looking.

The treatment of the second case was conducted on the same principles, but only gave rise to considerable amelioration. Even this, however, may be regarded as a progress, inasmuch as the majority of the members of the Society had pronounced both cases absolutely incurable when first submitted to them.—*Med. Times, Nov.* 17, 1849, *p.* 389.

3.—ON A MODE OF CAUTERIZING CANCEROUS TUMOURS WITH SOLIDIFIED NITRIC ACID.

Dr. Rivallie lately communicated to L'Union Medicale, his mode of cauterizing cancerous tumours with *solidified* nitric acid. He proceeds as follows:—Some lint is placed in an earthen vessel, and a certain quantity of nitric acid, in its highest degree of concentration, is gradually dropped upon it. A gelatinous paste is the result, and to this, a shape in keeping with the tissues be cauterized, is to be given. The caustic mass is then seized with long forceps, and placed upon the part. After a quarter of an hour, or twenty minutes, it is carefully to be taken off, and an eschar, four or five lines in thickness, is thus obtained. There are cases, however, where the caustic may be left for twenty-four hours, when the surgeon wishes to destroy a large encephaloid cancer. The pain is trifling except the skin intervene; and when the caustic is left a long time, there is no pain after the first three or four hours.! With large diseased masses, the cauterization should be repeated every day after the eschar has been carefully removed. When the caustic is applied for a few minutes only, the part should, on its removal, be dressed with lint dipped in a solution of alum. Dr. Rivallié gives a few cases where this method of cauterization was used with success.—*Lancet, Dec.* 1, 1849, *p.* 578.

4.—ON VARIOUS SCROFULOUS INFLAMMATIONS.—By G. M. HUMPHRY, Esq., Surgeon to Addenbrooke's Hospital, Cambridge.

The mucous membranes in various parts of the body are particularly subject to scrofulous inflammation, and that of the palate, nose, and throat, more so than any other. Some children are observed to suffer under continual cold, as their affection is called, with accumulation of mucus in the throat and nose, and a thick nasal voice. They snore a great deal and breathe with some difficulty, keeping the mouth always open. The mucous membrane of the throat and nose is in such cases reddish, swollen, and covered with glairy mucus; perhaps its surface is excoriated, or in the worst cases it may be covered with superficial ulcers. In summer these children get better, but in winter the complaint returns. Sometimes the inflammation extends along the eustachian tube to the tympanum, causing deafness. At others the soft palate becomes affected, the mucous membrane lining it is swollen and ulcerated; the ulceration may be communicated to the bones, and clear away the hard palate and septum nasi, causing *sad deformity*; or the lining membrane of the alveolar sockets becoming swollen, the teeth drop out without evincing any sign of decay, and the alveoli themselves ulcerate and necrose.

Sometimes the affection commences and is seated chiefly in the mucous membrane of the nose, causing swelling of it with superficial ulcération, or the latter may extend more deeply so as to perforate the septum or destroy the spongy and ethmoid bones. The disease is now and then associated with polypus, that is to say, the chronic inflammation of the schneiderian membrane may lead to a polypose condition of it, but you must be careful not to mistake for a polypus the loose swollen membrane which in consequence of its inflamed condition, hangs from the spongy bones into the nostril. The lining membrane of the lachrymal sac and canal is likely to become involved, causing obstruction to the tears, and watering of the eye; and unless early attention be paid to this disease, we have to fear the complete occlusion of the canal with the formation of lachrymal abscess and fistula, together with more or less caries of the adjacent bones. I may remark, that the disease of the bones here generally *follows* the inflammation of the mucous membrane, and the suppuration of the lachrymal sac, and may in most instances be prevented by a timely incision and the use of the style.

The mucous membrane of the respiratory apparatus may also be affected, either alone or conjointly with that of the nose and palate. Scrofulous children very often suffer from chronic bronchitis, attended with cough, "stoppage at the chest," wheezing, and the expectoration of frothy mucus. This goes on for a long time, but has no necessary connection with tubercles; indeed, this affection commonly subsides as the child grows older, and the lungs resume their natural condition. It is well for you to beware of the nature of this scrofulous cough, and its independence of organic disease, otherwise you would be likely to give unnecessary alarm to the parents. It is a very troublesome complaint, and leads sometimes to dilatation of the smaller air tubes, and perhaps occasions permanent dyspnœa, but it is not often fatal. I have not observed that it has any very close connection with the emphysema which occurs in early life.

The scrofulous affection of the *larynx*, which takes place after puberty is a more serious affair. In the early stages it is attended with cough, expectoration, huskiness and weakness in the voice, with inability to speak clearly, these symptoms are most felt early in the morning and damp weather. In course of time the mucous membrane becomes thickened, indurated and uneven on its surface, giving rise to roughness or hoarseness of the voice, with difficulty of expectoration, stridulous breathing, and liability to choking, also to tenderness of the larynx so that slight pressure upon it causes cough. Numerous minute ulcers form upon the surface of the membrane, or larger ones extend deeply into it and attack the cartilages. This disease is frequently associated with tubercles in the lungs. The local treatment of it consists in the application of astringent solutions,—such as nitrate of silver,—by means of a sponge passed into the throat, or what I think more frequently gives relief, a seton placed near to the larynx.

The tonsils are often enlarged in scrofulous persons, with or without accompanying inflammation of the mucous membrane. The disease seems to consist in a simple hypertrophy of the follicular basis, of which they are composed, without much alteration of structure. Sometimes they contain yellowish white spots, scattered through their substance, which look more as if they proceeded from discolouration of the tissue than from any new deposit into it. The tonsils thus enlarged are painless, and do not interfere with deglutition unless they are inflamed, but they alter the voice, and render the patient liable to sore throats, which are lingering and very distressing, sometimes even alarming, from the difficulty of breathing, occasioned by a lodgment of mucus in the narrowed passage of the fauces. On this account we are required to treat them. I have in some cases diligently persevered for months in the application of nitrate of silver and iodine, but I cannot say that the result was very satisfactory. As the child grows up, and more particularly after the period of puberty, they often diminish in size spontaneously; but if they are the cause of much trouble, it is worth while to remove them, which is very easily done with a probe-pointed bistoury and vulsellum, provided the patient is old enough to exercise a little self-control, and does not resist the operator. In children the operation is very troublesome, and I am unwilling to resort to it on that account, and from the fear of bleeding. I once knew hemorrhage take place to rather an alarming extent after the removal of a tonsil in a young man, but it ceased after a time, when he was kept quiet, with his head raised. In speaking of the removal of a tonsil—I mean that part of it which projects beyond the level of the pillars of the fauces—a portion of the gland is almost always left behind; and though I have heard the operation objected to on the ground that this remaining fragment is likely to enlarge, and have in consequence watched several cases for a considerable period, I have not known this to take place in any one.

The mucous membrane of the urinary and genital system is also very liable to inflammation in scrofulous persons. When affecting the bladder it forms a very troublesome complaint, giving rise to symptoms resembling those of stone, viz., frequent and painful micturition, the pain being felt over the pubes as well as at the extremity of the penis; sometimes there is incontinence. The urine generally contains a good deal of mucus or pus, and is sometimes tinged with blood; it is not that tenacious, white of egg-like, ropy mucus, adhering to the bottom of the vessel, which we are in the habit of seeing in common catarrhal inflammation of the bladder, but it forms a loose, white, milky sediment, and contains, perhaps, soft white flakes of lymph; it is commonly alkaline, and there may be particles of phosphate or carbonate of lime in it.

If the bladder be examined where such symptoms have existed during life, the membrane is found to be vascular, thickened, soft, and velvety. It may be covered with minute flakes, or an entire coating of lymph. Adhering to the lymph may be seen, as in this specimen, a white powdery substance, composed of carbonate and phosphate of lime. Sometimes the surface of the membrane is rough and excoriated, or the ulceration may have proceeded more deeply, and you may find several small circular ulcers, proceeding from central points of grey deposit, like tubercles, and running together, so as to form larger ulcers; or there may be, as you see in this specimen, a more extensive deposit of soft grey substance in the structure of the mucous membrane, and in the submucous tissue, with ulceration commencing at many points, and forming a large, ragged, dirty surface, resembling much the corresponding disease in the mucous membrane of the palate and in the skin.

Not uncommonly the inflammation is found to have extended along the lining membrane of the ureters up to the kidneys. Here is an instance where the ureter is enlarged nearly to the size of my little finger, and choked up with a soft, yellowish, white substance, so as to leave only a narrow channel down the middle, through which the urine continued to trickle. This condition extends quite up to the kidney, and you observe that the pelvis and calices are also much dilated, their lining membrane swollen, and covered with a soft white secretion, composed probably of diseased epithelial scales, mixed with a substance intermediate between pus and the lymph of scrofulous inflammation. There are also yellowish white spots in the substance of the swollen membrane. Some of these have softened, and their contents have been washed away, leaving small cavities, which look like ulcers. In the substance of the kidney are other spots and cavities, which may be sections of the urinary tubes; diseased in the same manner as the pelvis and calices, or they may result from independent deposits into the glandular structure of the organ. Some of the cavities are of considerable size, having been occasioned no doubt by the coalescence of smaller ones.

Now, a precisely similar disease to that which I have been describing in the urinary tubes and kidneys, is of no uncommon occurrence in the genital tubes and testicle; moreover, the two sets of organs are frequently affected in the same person. The convoluted series of tubes at the two ends of the vasa deferentia, viz., the vesiculæ seminales in the one direction, and the epididymis in the other, are generally attacked first, and the disease extends from them to the adjacent glands, to the prostate from the former, and to the body of the testicle from the latter.

As the disease advances the tubes become more distended, the scrofulous substance contained in them softens into a curdy fluid, with which some pus is intermixed; the lining membranes of the tubes become impregnated with the same substance, deposited in spots, or more generally infiltrated through their tissue. The membranes are in this manner destroyed, and the natural structure of the part is lost by the fusion of the tubes into cavities, which, enlarged by the increasing accumulations in their interior, project from the epididymis into the loose tissue of the scrotum, surround the testicle, and at last burst through the skin, discharging their contents, and leaving sinuses. The sinuses thus made often remain open for months and years, forming channels of communication between the interior of the epididymis and the surface of the body. They discharge a thin fluid, in which spermatozoa may be sometimes found.

You observe that the disease consists not simply in the accumulation of scrofulous substance in the tubes, but that the lining membrane of those tubes also undergoes a change.

Scrofulous disease of the testicle is of common occurrence. Sometimes it occurs as the remnant of acute epididymitis, but more frequently it begins insidiously, and proceeds with little or no pain. A patient applies to you in consequence of enlargement of his testicle, which is attended with some uneasiness in the part, and some aching in the loins. You find the epididymis enlarged with soft swellings, perhaps, projecting from it; the vas deferens may be also large and knotty. At first you can distinguish that the body of the testicle is healthy, but it subsequently ceases to be so, or it becomes so lost in the swollen epididymis that you can gain no information respecting it. You will not, in such a case, forget to examine the other testicle, the vesiculæ seminales, and the prostate, and to inquire into the condition of the urine and the state of the bladder.

The several cases which have been, and now are, attending at the hospital, have given you reason to know that the scrofulous affection of the urinary and genital system, particularly of the testicle, is by no means more easy to cure than the other forms of scrofula. In some of those cases we have tried a variety of remedies without any apparent advantage. In truth, it is generally accompanied by fewer indications of treatment than most other scrofulous affections, and, though like them, associated with want of vigour of the nutritive functions, it is, I think, less commonly accompanied by the symptoms of disorder of the digestive system. You will find it a rule, with exceptions no doubt, that the scrofulous cases which are devoid of that accompaniment, are the most difficult to cure, because they are the most directly and completely dependent upon the constitutional defect. The measures most conducive to the general health must be tried, such as simple and nutritious diet, fresh air, and tonic medicines. The application of a solution or ointment of iodine, so as to produce slight irritation of the scrotum, may do some good. The internal administration of iodine and cod-liver oil are also sometimes beneficial. There is no doubt that many of these cases get well as the patients become stronger; we may, therefore, encourage them with the prospect of a cure, though we are unable by any direct means to contribute very greatly to it.

The prospect of acute inflammation degenerating into this tedious and destructive chronic disease, will make us especially anxious to arrest the disorder quickly when called upon to treat the common "hernia humoralis" in persons of delicate scrofulous habit. We shall be careful that no traces of it are allowed to linger behind, especially as in the debilitated state to which the patient is reduced by an acute attack the organ is often slow to recover its natural condition, and if the antiphlogistic treatment, with confinement to bed, be continued too long, the chronic disorder may not unlikely be engendered.

We are sometimes called upon to consider the question of the removal of the organ. It is seldom imperatively necessary to do this, but when the disease has so destroyed the natural structure of the organ as to render the restoration of its function improbable, it is advisable to remove that which has become a mere burthen and source of annoyance, especially if the patient be confined to bed in consequence of it, and his strength is being weakened by the successive formation and bursting of abscesses, and by the discharge from them. I do not think that the existence of the disease in other parts of the genital system is of itself sufficient to preclude an operation, because in the cases which I have seen, the removal of the one testicle has not been followed by an increase of the disease in the other, but, on the contrary, the remaining organ has appeared to fare rather better, and to recover more quickly. The experience of one person, however, cannot furnish sufficient data for the decision of such a point as this.

There is one other circumstance which I must mention to you before dismissing this subject of the scrofulous disease of the testicle—and that is its frequent association with phthisis pulmonalis. This has happened in about one half of the cases I have seen.

In the scrofulous disease of the bladder, especially when the urine is alkaline, small doses of the mineral acids, given in bitter infusions, are often productive of benefit; also iodine in the form of the iodide of potassium, and the preparations of steel. It is very important to rectify any disorder of the digestive organs that may accompany it, for all the inflammatory affections of the bladder are much influenced by the state of the stomach, and care in diet must be strictly enforced. If, in spite of these precautions and remedies the disease still lingers, or shows a disposition to increase or spread to other parts, you had better adopt some permanent counter-irritation, such as an open blister, or, still better, a seton above the pubes or in the loins.

The genital organs in the female are also liable to scrofulous inflammation. There may be deposit of lymph and abscess in the ovary, but that is not common. The Fallopian tubes are more frequently the seat of this disease. Here you see a specimen where those tubes are lengthened, contorted and greatly enlarged. They increase in size towards their free extremities, which were adherent to the surrounding parts. The mucous membrane lining them is much swollen, and of a yellowish-white colour, having undergone the same change as the mucous membranes of the ureters and vasa deferentia in the specimens I just showed you. The tubes also contain some soft scrofulous matter. The uterus itself is healthy, though of small size. Here is another remarkably small uterus taken from a person who was of a scrofulous constitution. This disease of the Fallopian tubes, though existing in a much slighter degree than in the specimens before you, would be likely to occasion sterility.

The scrofulous disease of the *synovial membrane* is the most common cause of white swelling of a joint. In the early stage the membrane is merely thickened, has a somewhat granular appearance, and is semi-opaque, of pale colour, with a brownish or reddish tinge. Soon it is found to be mottled with white spots of various sizes, scattered more or less thickly through it; sometimes they look like mere minute specks, at others they consist of a discoloration of considerable portions of the thickened membrane. As I have before said, these spots seem to depend rather upon a change taking place in the structure of the already diseased membrane than upon any fresh deposit into it. However this may be, they frequently soften into a white curdy fluid, become connected with one another in the same manner as small abscesses do in other parts, and either burst externally, or find their way into the cavity of the joint.

I think it is very important the patient should not be confined to bed or to the house, more than is absolutely necessary; for I am quite certain that the local disease is often much aggravated in consequence of the injury to the health occasioned by close confinement. At the same time it is important that the joint should be kept quiet when it is at all tender, painful, or uneasy after exertion. To secure this it is a good plan to fix and support the joint by means of bandages, plasters, and leather or gutta percha splints, while the patient is allowed to go out upon crutches. The tincture or ointment of iodine applied every night and morning, so as to produce some irritation of the skin, but not sufficient to prevent the skin being bandaged during the day, is one of the best local applications. It may be alternated with other stimulating liniments, with blisters, or, in slight cases, with the cold douche. When abscesses form I generally allow them to burst, because their contents are thus discharged more freely, and the slight loss of skin occasioned thereby is not very important.

I have tried the cod-liver oil in many of these cases,—in a few with decided advantage, but in many instances it seemed to do no good. I cannot say that I have found iodine administered internally of much service in this disease.

If you have studied the pathology of *tubercles* at all you cannot have failed to remark their close apparent resemblance to these little deposits of ill organized lymph I have been speaking about, which form a prominent feature in scrofulous disease, occasioning so much destruction of tissue, and giving rise to the formation of ulcers, in consequence of the softening and suppuration they have a tendency to undergo. It is probable, I think, that the relation between tubercles and these deposits of scrofulous lymph is not one of mere external resemblance, but that they are in their real nature and essence very closely allied.

A tubercle consists of a small mass of heterogenous substance interstitially placed with regard to the tissues in which it is embedded. It does not increase to any great size, but it softens and suppurates, destroying at the same time the tissue involved with it, and so forms a cavity. The contents of this cavity, increasing like those of an abscess formed in any other manner, occasion absorption or ulceration of the structures intervening between them and the surface, and are discharged. About the time that the softening commences, inflammation is set up, and lymph effused in the circumference of the tubercle, walling it in, and forming the lining of the cavity. The destructive effects of tubercles depend not upon the ability of each one to attain to a great size, and, like a cancerous growth, to go on spreading at one part while it is softening at another, but upon their disposition to occur in considerable numbers, all of them running the same course, and forming cavities, which coalesce into larger ones, and so make great havoc, sometimes hollowing out, as in this specimen, the entire substance of the lung. An individual tubercle, when it has softened and burst, has done its worst; the cavity left by it is lined with the common lymph of inflammation, which would contract and cicatrize, and there would be an end of the matter, did not other tubercles exist in the neighborhood undergoing the same changes, bursting into this cavity, and continuing the work which the first had begun.

When I suggest that tubercles are nearly related to the scrofulous deposits which I have described to you in this and the former lectures, I do not mean to intimate that they are dependent entirely upon inflammation, or that they consist of masses of lymph strictly so called, for there is often, indeed commonly, no evidence of their being preceded or accompanied in their first stages by any inflammation; and you remember that according to our definition made on a former occasion, lymph is effused fibrin altered by the inflammatory process; but I mean, that they probably consist of some of the imperfectly elaborated components of the blood, the albumen or the fibrin, changed, it may be, in some manner, and effused among the tissues. These remarks apply also in some measure to the scrofulous deposits, which are often preceded by no signs of inflammation, and which sometimes seem rather to excite than to depend upon that process.

Both in the scrofulous and tuberculous subject, particularly the latter, when genuine acute inflammation is induced, the effused lymph partakes more nearly of its ordinary or healthy characters. Sometimes, however, even then, it has the constitutional defect impressed upon it, giving rise to what is called tuberculous and scrofulous infiltration, which is not always confined to small spots and masses, but may extend through a considerable space.

The degree in which tubercles differ from the ordinary scrofulous deposits varies according to the constitution and age of the patient. In the young, light complexioned, delicate patient, who presents the signs of the scrofulous diathesis most strongly, the tubercles are from the first large, of yellowish-white color, and cheesy consistence, closely resembling, in short, the common scrofulous deposits; so closely, that the one can scarcely be distinguished from the other. They are attended with inflammation in an early stage, soften quickly, and run their course in a comparatively short period. In older patients, and in the dark-haired, thin, active persons, who exhibit fewer traces of a scrofulous habit, the tubercles are at first much smaller and harder, forming little semi-opaque horny grains, which easily escape notice; these have been called miliary tubercles. They are slower in their changes, remaining sometimes quiescent, or advancing but little for months. In their progress they increase a little in size, become more opaque, of white or yellowish-white color, so as to resemble those last described, and then gradually soften and form cavities. These miliary tubercles have been thought to form the early stage of those first mentioned, and so, no doubt, they often do, but the large white tubercles are very frequently found presenting their own distinctive characters from their first commencement in the class of persons I have mentioned.

The softening of tubercles, though generally accompanied by some inflammation and deposition of lymph in their circumference, is in all probability independent of that imflammation, or rather may be regarded as its exciting cause. It seems to depend upon some quality inherent to the tubercles themselves; often it begins in the centre, and forms a cavity there, so that when the tubercle is opened it looks like the divided end of a tube. This appearance has given rise to the mistaken notion entertained by Carswell and some other pathologists, that tubercles of the lungs consist in a concentric deposit within the minute bronchial tubes.

Tubercles, and as I have just said, the small grey miliary tubercles particularly, sometimes fall into a quiescent state, become dry, and the surrounding pulmonary tissue loses its increased vascularity. Even after softening has commenced they sometimes retrograde, drying up, and undergoing calcareous transformation, while the lymph effused into the surrounding pulmonary tissue contracts upon them, and gives rise to a puckered appearance, like a cicatrix. We often find in old persons, these traces of the tuberculous disease of early life. Whether they are ever absorbed in the early stages, and disappear entirely, so as to be quite cured, is uncertain, though it is probable that they do so.

The lungs are more frequently the seat of tubercles than any other organ of the body, and the distinctive characters of the morbid product are most clearly marked in them. On the peritoneum also, they are of common occurrence, both the small, hard, grey tubercles, and especially the large, soft, white ones, which have a near resemblance to scrofulous deposit, and which, as I have just intimated, seem to form the connecting link between tubercle and scrofula. In the liver, spleen, and brain, tubercles are less common, and approximate still more closely to scrofulous masses; and in the absorbent glands, the skin, and the bones, the deposit which I have described as the result of scrofulous inflammation, is by many pathologists ranked under the head of tubercle.

I do not think that persons who suffer from scrofula are much more liable to tuberculous phthisis than others. This is scarcely to be considered an argument against the supposition of the two diseases being very nearly allied, and is no more remarkable than the fact that each of them is so frequently confined to a particular organ, or a particular class of tissues.—Tubercles are often found only in the lungs, and I told you on a former occasion that scrofulous affections are very commonly limited either to the absorbent glands, the skin, or the bones, in individual cases. Even if tubercle and scrofula be *identical*, each deriving its peculiarities from some quality of the organ affected, it is no wonder that the two are not found to co-exist more frequently.

I have already mentioned that the scrofulous disease of the testicle is very often associated with tubercles in the lungs, and I have observed that the same is true of scrofulous abscesses on the thorax connected with disease of the ribs. There are patients at the hospital at the present time whose cases illustrate the truth of this remark. It is also a general impression, and, I think, a well-founded one, that patients who, in early life, were troubled with scrofulous affections, are, after the age of puberty, when the disease of their childhood has passed away, very liable to fall victims to tuberculous disorganization of one or other of the internal organs. —*Prov. Med. and Surg. Journal, Dec.* 12, 1849, *p.* 673.

5.—OBSERVATIONS RESPECTING ASCITES.—By Dr. Dubini.

1. When ascites is not the result of a pre-existing, or present, acute or chronic primary peritonitis, it will be found to depend upon hypertrophy with degeneration of the hypochondriacal viscera, the presence of abdominal tumours, a prior of existing dysentery, or upon *cirrhosis* of the liver.

2. In fact, peritonitis depending on these various conditions of the viscera, is almost always the efficient cause of the effusion. In respect to the operation of visceral hypertrophy and abdominal tumours in inducing it, there can be no doubt. In dysentery, with ulceration of the mucous membrane, inflammation of the peritoneal coat is found. In *cirrhosis*, observation would seem to show, that the fluid may collect in consequence of peritonitis, or, on the other hand, mechanically from obstruction of the capillaries of the liver.

3. Post-mortem examinations prove, that defective absorption by the lymphatics, as a cause of dropsy, is a scholastic fable. Atony may follow the distension and destruction of tissues in the dropsical, but it is never, or with exceeding rarity, primary.

4. Ascites must not be confounded with other serous effusions, especially with general anasarca. The common causes of general dropsy, as hydræmia, scarlatina, Bright's disease, suppressed perspiration, &c., are not the direct causes of ascites, which, as already observed, has its own special cause, and seems also to recognise other directly or indirectly predisposing ones, such as intermittent fevers, abuse of spirituous drinks, and a certain inelastic and relaxed state of the organic tissues.

5. Diseases of the heart, so frequent a cause of anasarca, are never the primary cause of ascites, and if the two are found in co-existence, it is a mere coincidence. A diseased heart may lead to a hypertrophied or degenerated state of the liver, and this may give rise to ascites.

6. In enormous and old ascites, in which long and forcible pressure has been exerted upon the viscera by the fluid, a shortening of the intestinal tube takes place. In one case, the entire length of the canal was not more than three times that of the body.

7. The treatment by means of drastics is prompt, and always much desired by the patient, who wishes to relieve the distension as rapidly as possible. It is rare for them, however, to produce a permanent cure, and the relief they at first afford is often followed by a relapse, under the influence of which the patient quickly finds himself in a worse state than before. If a red, shining, or excoriated tongue indicate a pre-existing diarrhœa, in place of a relapse, drastics will cause irreparable mischief, by provoking a second and artificial diarrhœa, which will only cease with life itself.

8. Diaphoretics, employed in this generally non-febrile disease, are praised in the books: but what practitioner ever prescribed them for apyretic ascites? Nature alone, in particular cases, contrary to our physiological laws, induces simultaneous profluvia of sweat and urine, until the ascites is totally dispersed. Iodine and mercurial frictions are but therapeutical delusions, although in certain cases in which the symptoms of peritonitis still exist, calomel may be of service. The frequent failure of diuretics is well known.

9. When even the local abstraction of blood is no longer admissible, and it hence presumable that the peritonitis no longer exists, *compression* of the abdomen by a bandage is a useful aid to diuretics. Like all other means it may be misused, but twelve years' experience of it leads the author to state, that if the dropsy be not encysted, and the lower extremities have not become œdematous, compression will not only in the majority of cases remedy the effect, but frequently also remove the morbid cause of the effusion. In very many cases, he has seen the same diuretics, which had long been uselessly employed, succeed admirably as soon as a methodical compression was conjoined to their use.

10. After recovery, when the ascites has depended upon dysentery or primary chronic peritonitis, a relapse may be prevented by opening an issue, at the inner side of the leg, just below the knee. After the application of a very small blister, a minute ivory ball may be compressed against the denuded surface to effect this.

11. There are certain cases of anasarca, from *hydræmia*, in which the ascites though not primary is very considerable, and threatens suffocation from its rapid increase. In these there is always found a degree of hypertrophy of the liver, a section exhibiting it of a bright yellow colour, and of the consistence of soft chalk. The blood is scarcely red, and very watery. All the symptoms of chlorosis, and some of those of scorbutus are present, as palpitation, syncope, vertigo, tinnitus, muscular debility, pallor of the mucous membranes, anorexia, thirst, constipation, paucity of urine, and sweating, with frequent attacks of epistaxis. In these cases, the *souffle* heard after the first sound of the heart is rather referable to the serous crasis of the circulating fluid, than to any defect in the circulatory organ.

For this train of symptoms the author had long sought medicinal substances, which, while they proved unstimulating diuretics, might remedy the condition of the blood without disposing the organism too much to a state of phlogosis, which, in subjects of hydræmia, always terminates in new effusions, that in their result prove fatal, if they do not so in their immediate consequences. What he terms a "martial lemonade," has best fulfilled by its effects the chief indications, and especially by causing a free diuresis. It is formed by dissolving six grains of *sulphate of iron* in a pound and a half of water sweetened with an ounce of syrup, and adding a drachm of *sulphuric acid*—the period and continuance of its administration, and the dose in which it is given, being regulated by the practitioner, according to the exigencies of the case. Its use is contra-indicated in those cases in which the tongue is red and glazed, or has prominent papillæ, and when a certain amount of febrile action indicates the presence of thoracic inflammation or of hepatic peritonitis.—*Bulletino delle Scienze Mediche—Brit. and For. Medico-Chirurg. Review, April*, 1850, *p*. 536.

6.—ON THE RESPECTIVE VALUE OF LIME-JUICE, CITRIC ACID, AND NITRATE OF POTASH, IN THE TREATMENT OF SCURVY.—By Dr. ALEX. BRYSON, R. N.

[Instructions were given several years ago to the surgeons of convict ships, that if scurvy broke out during the voyage, they were to try the relative effects of lime-juice, nitrate of potash, and citric acid; choosing similar cases for experiment, and placing the patients under like circumstances of diet and exercise. Dr. Bryson details some results which have been thus obtained. He says,]

In ten vessels, in which the disease made considerable progress, and in which the trials were conducted according to the instructions, the conclusions arrived at were as follow:—The different vessels, for the sake of brevity, may be numbered. In the first the citric acid was considered to be the most effective. The nitre, which appears to have been sometimes combined with lime-juice, although it was also given separately, disagreed with most of the patients, causing irritability of the stomach, and relaxation of the bowels, to such a degree, that it was necessary to combine opium with it. In the second, it was supposed there was not much difference between the remedial action of the citric acid and nitre; both were considered to be preferable to the lime-juice. In the third, the citric acid and lime-juice appeared to have the power of arresting the progress of the disease, but not of curing it. The nitre seemed to impair the powers of digestion and assimilation, and was therefore considered to be injurious. In the fourth, the curative effects of the citric acid and lime-juice were about equal, the former being preferred by the patients as being more palatable; those to whom the nitre was given, complained of its acting on the kidneys, and causing constipation of the bowels. In the fifth, (the only vessel in which it may be said the experiment was fairly tried,) the usual allowance of lime-juice was withheld from the prisoners, in order that the effects of each remedy might be the more clearly observed, if scurvy occurred on the voyage. It consequently made its appearance before the ship had crossed the equator. Forty-five patients, in all stages of the disease, were selected and treated in three divisions, according to the instructions. The plan was rigidly followed out for a fortnight, when the nitrate of potash was found to be acting so injuriously, and to be taken with so much reluctance, that its use was altogether abandoned. All the patients in the division to which it was given, rapidly lost ground, while those in the other two improved or remained nearly stationary. The lime-juice was supposed to have a slight superiority over the citric acid. In the sixth, the disease, under the potash plan of treatment, was found either to be aggravated or to remain stationary. The lime-juice, although it had been daily administered as a preventive during the early part of the voyage, when given more frequently and to a greater extent, was considered to be more effective than the citric acid; but both were useful. In the seventh, in which the remedies hardly had a fair trial, each division improved gradually, but that to which the nitrate of potash was given, the fastest. In some instances, in which it disagreed with the patients, they were removed to the lime-juice list. The dose was fifteen grains per diem. There were altogether thirty-one cases of scurvy, which were cured in a little more three weeks; they could not, therefore, have been of a very severe character. In the eighth, the remedies were considered to be of equal value. The experiment, however, was interrupted at an early stage, by the arrival of the vessel in port. In the ninth, the daily allowance of lime-juice was not issued, consequently, as in the fifth, the disease made its appearance before she crossed the equator. Thirty-four prisoners were arranged in divisions, and placed under treatment on the 6th of September, 14 upon lime-juice, and 10 on each of the other remedies. On the 11th day of the treatment they were examined, when it was found, that out of the 14 on lime-juice, 3 were well, 9 better, and 2 stationary. Of the 10 on citric acid, 3 were well, 5 better, and 2 stationary: and of the 10 on nitre, 2 were well, 7 better, and 1 stationary. It would thus appear, that the patients improved under the use of all the remedies, the advantage being slightly in favour of the vegetable acids. Lime juice appears to have been given instead of the nitre, in several cases where the latter disagreed. In the tenth ship, the nitrate of potash and citric acid, for the first few days, appeared to be acting favourably; but, as many of the patients, in each of the three divisions, began to get worse, the use of the medicines singly was abandoned. Afterwards they were given in combination, but without any satisfactory result.

The diet of the patients in all these trials was altered, and considerably improved by the substitution of preserved meats and soup, instead of salt meat, to which were added puddings of rice and flour—an increased allowance of tea and sugar, together with port-wine and sago occasionally, as they seemed to be required; thus rendering it exceedingly difficult in some instances, and altogether impossible in others, to arrive at anything like a proper estimate of the positive abstract advantages attributable to the different medicinal and dietetic agents employed. There seems to be, however, little reason to doubt, judging from the results in these trials, and from others which were not so well conducted, that the alkaline salt has not the antiscorbutic properties which have been ascribed to it; while, from its nauseous, mawkish taste, and injurious effects on the system generally, unless in very minute doses, it would be worse than cruelty, under any circumstances, to persist in its exhibition in this disease, either as a prophylactic or as a means of cure.

The other two remedies, when given in combination with wine and sugar, in the form of lemonade or sherbert, form a beverage highly prized by the patients in every stage of the disease. Their relative value as remedial agents, if an opinion may be formed from these experiments, seems to be nearly on a par, although it is necessary to bear in mind that the lime-juice might probably have acted with better effect, or at all events its action would have been more apparent at the time of trial, had it not been that its influence in exciting the digestive organs to a more healthy formation of chyle, was greatly diminished from long-continued use previously.. Citric acid as a preventative has hardly yet been fairly tried; neither has either of these remedies, much as they are extolled, been tried without sugar—an article of itself highly nutritious, agreeable to the palate, and generally much relished when the apetite begins to flag, under the protracted use of the ordinary sea rations. It seems, therefore, by no means improbable, that the effects of both remedies have been considerably enhanced by the sugar in combination with which they were given. The latter, in fact, is not only a nutritious and wholesome substance, but, like salt, it acts as a condiment when combined with certain other articles of food, rendering them not only more acceptable to the palate, but more suitable to the organs of digestion and assimilation.

In consequence of the apparent occasional failure of lime-juice, when given as a prophylactic on long voyages, it has been somewhat hastily assumed by one or two writers, that it has not the properties attributed to it. The following circumstance, however, would lead to a very opposite opinion. In the year 1842, fifteen vessels left England with prisoners for Van Dieman's Land; in three of these only did scurvy assume anything like a severe form. This naturally led to the inquiry, whether there was anything different or peculiar in these vessels; in the physical condition of the men when they embarked, or in their diet and mode of living afterwards, to account for the appearance of the disease in them, and not in the others; for it was hardly possible to suppose it could be merely the result of chance. The provisions were obtained exclusively from the stores of the Royal Naval Yard at Deptford, and it may, therefore, be supposed that they were in every respect the same, and of good quality. The vessels were fitted up and ventilated much in the same manner, and the prisoners who were obtained from similar sources, and to all appearance in the same condition of health, fit for the voyage when embarked, occupied relatively the same room in each; the provisions and "medical comforts" were issued in the same manner in the whole of the fifteen vessels, with two exceptions; in these, as previously noticed, the usual allowance of lime-juice and sugar, one ounce of each per diem for every man on board, for reasons that need not be stated here, was withheld from the prisoners during the early part of the voyage. In both vessels scurvy appeared soon, and attacked a large proportion of the prisoners with great severity, rendering it necessary for both the vessels to put into the Cape of Good Hope for refreshments; while in twelve of the fifteen vessels, several of which made the passage to Hobart Town in from 110 to 140 days, without touching anywhere, there were but few cases, and these were of trivial importance. In the other vessels, however, in which lime-juice was issued in the usual manner, the disease broke out early, and during the passage, which, nevertheless, was made without touching at any port, it acquired considerable severity. Were it not for the appearance of the disease in this vessel, it might be fairly assumed that it broke out in the two others in consequence of the non-issue of lime-juice: and, after all, the probability is, that such was the case, for it would appear, that in her, the prisoners, contrary to the usual practice, were only permitted to come on deck for a few hours every day,—a circumstance in itself sufficient to establish the scorbutic diathesis, independantly of the want of vegetables and a fresh meat diet.

On a fair view of the question, therefore, it seems but reasonable to infer that the prisoners in the twelve vessels derived their comparative exemption from the disease, solely in consequence of the greater degree of freedom they enjoyed, and the daily use of lime-juice and sugar; in the two in which they suffered so greatly, that it was in consequence of their having been deprived of their usual allowance of lime-juice and sugar; and in the fifteenth vessel, that they were attacked by the disease in consequence of their close confinement below, in the damp, vitiated atmosphere in an ill-ventilated prison. Hence the inevitable conclusion, that lime-juice and sugar are essentially nesessary as anti-scorbutics on long voyages.

Med. Times, March 23, 1850, *p.* 213.

7.—TREATMENT OF INTERMITTENT FEVER WITH A SINGLE DOSE OF QUININE.

Dr. **Pfeufer**, of Heidelberg, states he has had much opportunity of treating this disease, and was formerly in the habit of prescribing from 15 to 20 grains, in divided doses, in the intervals of the paroxysms. Latterly he had given five-grain doses, until from 40 to 60 grains were taken, and with great success. The number of patients having greatly increased during the bivouacs consequent upon the revolutionary disturbances, the expense of so much quinine was found a serious consideration, and he determined to try whether by a different mode of administration less might not suffice, and, certainly, if the result he has arrived at are confirmed by others, he will have conferred no ordinary boon upon the distributors of charitable medical relief. He finds, indeed, not only that the expense may be vastly diminished, but the cure expedited and rendered more certain, by administering a *single ten-grain dose* (made into four pills, with ext. of *millefolium*), on a day free of fever. This dose is well borne, none of the inconveniences which result from the long-continued use of small doses, or the tinnitus, giddiness, &c., produced by very large ones, presenting themselves. The subsequent attack is weaker, and its successors still more so, the convalescent remaining in the hospital from four to eight days. A tabular view of the particulars of 34 cases so treated is given.—*Henle and Pfeufer*'s *Zeit.*—*Brit. and For. Medico-Chirurg. Review, April* 1850, *p.* 534.

8.—ON THE MEANS OF EXTENDING THE PROTECTIVE POWER OF VACCINATION.—By Dr. W. S. Oke, Physician to the Royal South Hants Infirmary.

[Dr. Oke makes the following remarks on the method of performing vaccination.]

1st, No lymph should be taken from a vesicle after it has begun to lose its transparent character, *i. e.*, after the eighth day, and if practicable it should be at once communicated.

2d, The puncture should be made by carrying the point of a lancet, held flat to the arm, obliquely downwards through the cuticle into the surface of the cutis, and whatever instrument be used to apply the lymph, it should remain inserted a few seconds, and then be wiped upon the orifice.

3d, Six punctures *at the least* should be made, either on the arms or on different parts of the body, for it is not improbable that many vaccinations have failed as a protection from not having made a sufficient prophylactic impression upon the system. The same result occurs in other blood diseases, and why not in this? For example, in scarlet fever and measles. If the blood in either of these be not sufficiently impregnated by the first attack, the constitution has been found susceptible of a second. I have seen six or seven punctures adroitly made by an experienced vaccinator in three or four seconds of time, but as these are apt to result in a *confluent* cluster of vesicles, the more deliberate method is to be preferred.

4th, Where the vaccination has resulted in a single vesicle, it ought not to be disturbed; and it may sometimes be satisfactory to try its efficacy by the test of Mr. Bryce, introduced in 1802. It is this: Re-insert vaccine lymph on the evening of the fifth, or morning of the sixth day; and if the second vesicles, which of course will be comparatively small, grow rapidly, overtake the first, and the whole scab together, it will prove the blood to be impregnated by the first vaccination. And where there are more than one vesicle, if their development should not be satisfactory, Bryce's test will be equally required.

5th, The vesicles should be guarded against accident, attentively inspected during their progress, and any irregularity be accurately noted.

Having thus pointed out what I consider to be the best means of fully carrying out the efficacy of vaccination, it seems right briefly to inquire if there be any method of proving the constitution to be still under its protection, especially when exposed in after-life to the contagion of small-pox?

The only thing that can help us under a feeling of uncertainty is re-vaccination, but this need not be employed till after the expiration of eight years from the primary vaccination, as, according to Dr. Gregory, its protective power has hardly ever been found to fail for that period of time. 'Recent active lymph should be used for this purpose, and conveyed at once from arm to arm, in order that the *some kind of action* may be produced. If it occasion local irritation, even to a considerable extent, without any *specific* character, the constitution may be considered still under vaccine protection; but if it result in the development of a normal vaccine vesicle, especially if proved to be such by Bryce's test, it may fairly be inferred, on the other hand, that the primary vaccination had ceased to be a protection.

Re-vaccination in the above point of view is of considerable value, and until the efficacy of one vaccination, like one inocculation, can be confided in as a permanent security, it will undoubtedly be right that vaccinated persons, whenever exposed in after life to the contagion of small-pox, should submit to this test. Medical men more particularly require it, and at reasonable intervals of time.

Lastly, it is a popular notion, that vaccine lymph, from having passed through such a lengthened chain of the human race, must necessarily have degenerated, and, in a great measure, have lost its prophylactic power. There is nothing unreasonable in such an apprehension on the part of the community; in fact some currents of lymph have been found to degenerate, and have, therefore, been abandoned. If ever the *general* current of lymph should become degenerated, and unsatisfactory in its developments, there would certainly be a necessity to derive it afresh from the teats of the cow. Retro-vaccination—that is, passing the failing lymph again through the blood of the animal, would not renew it, nothing short of a new supply from the primary disease could suffice. But such a general degeneration has not happily been experienced, and so long as the humanised vaccine vesicle presents its normal character, it will need no renewal, though it shall have passed through a thousand generations.—*Prov. Med. and Surg. Journal, April* 3, 1850, *p.* 173.

9.—CASE OF SMALL POX OCCURRING WITHOUT OBVIOUS CONTAGION.—

By Dr. BANKS, Lawrenceville, U. S.

A lady, æt 20, pregnant five months, and of robust constitution, after several days' febrile action, became the subject of a well-marked attack of confluent small pox. The desquamation was by the fifteenth day in "full blast," when secondary fever arose, and before "she had scaled off," she sank and died, having, about the tenth day given birth to a child, which was covered with eruption, and lived but three hours. The nature of her case was not understood by her attendants, until it was found that she had become a focus of small-pox contagion, which spread freely among the non-vaccinated. The family of this lady lived in an out-of-the-way place, no small-pox having been within a hundred miles of it, and no intercourse with strangers to the village, or with persons from a distance, having occurred for months. Although she was ill seven days before the special symptoms of small-pox appeared, the eruption in those who took it from her, or from others who did so, commenced at the end of the third, or beginning of the fourth day.

The editor of the journal in which this case is inserted, refers to two which recently occurred in the Eastern Penitentiary of Pennsylvania, in which the "separate system" is strictly enforced. In one of these cases, the convict had been incarcerated for two years, and the other six.—*Philadelphia Med. Examiner.—Brit. and For. Medico-Chirurg. Review, April,* 1850, *p.* 533.

DISEASES OF THE NERVOUS SYSTEM.

10.—ON THE PHYSIOLOGY OF THE NERVOUS SYSTEM.

[A writer in the British and Foreign Medico-Chirurgical Review enters at considerable length into this subject, founding his observations upon the recent works of Dr. Todd and Dr. Gull. He begins by giving in the words of Dr. Todd, the following statement of some of the most important questions at issue.]

"Having shown that the spinal cord is concerned in voluntary motions and in sensation (mental nervous actions,) and in certain reflex actions as well as in certain organic functions (physical nervous actions,) it is important to ascertain what is *the mechanism* by which these various actions take place.

"The most convenient way to discuss this point will be to examine into the value of certain hypothesis which have been framed to explain it. We shall find it necessary in this discussion to keep before us two propositions, in favor of which sufficient evidence has already been adduced. These are,—1. That the brain or some part of it is essential to the production of mental nervous actions; in other words, the acts of volition and sensation cannot take place without the brain; and, 2. That the vesicular is the truly dynamic nervous matter, that which is essential to and the source of the development of all nervous power.

"The first hypothesis which we shall notice is one of so much ingenuity, that one is tempted thereby to adopt it, and would gladly do so if it were found sufficient to explain the phenomena, and if it were consistent with that simplicity which characterizes the mechanism of the body. It originated with Dr. Marshall Hall, and has been advocated by him with great zeal and ability; it may be distinguished as the hypothesis of an *excito-motory system of nerves, and of a true spinal cord,* the centre of all physical nervous actions.

"This hypothesis may be stated as follows:

"The various muscles and sentient surfaces of the body are connected with the brain by nerve-fibres, which pass from one to the other. Those fibres destined for or proceeding from the trunk to the brain pass along the spinal cord, so that that organ is in great part no more than a bundle of nerve-fibres going to and from the brain. These fibres are specially for sensation and volition—*sensori-volitional.*

"But, in addition to these, there is, according to Dr. Hall, another class of fibres proper to the spinal cord and to its intracranial continuation, which form a connexion with the grey matter of the cord. Of these fibres, some are afferent or incident, others efferent or reflex, and these two kinds have an immediate but unknown relation to each other, so that each afferent nerve has its proper efferent one, the former being *excitor*, the latter, *motor*. The aggregate of these fibres, together with the grey matter, constitutes the *true spinal cord* of Dr. Hall, which is not limited to the spinal canal, but passes up into the cranium as far as the crura cerebri. (Its extent, indeed, is much the same as that which has been assigned by Prochaska to his *sensorium commune*.) These fibres are quite independent of those of sensation and volition. and of the sensorium commune, using that term as indicating the centre of intellectual actions. Although bound up with sensitive and motor fibres, they are not affected by them, and they maintain their separate course in the nerves, as well as in the centres.

"2. A second hypothesis is that which accords with the views of Müller and many other physiologists of the present day, and likewise probably with those of Whytt. It assumes that the fibres of sensation and volition proceed to and from some part or parts of the intracranial nervous mass,—that every nerve-fibre in the body is continued into the brain. Those which are distributed to the trunk and extremities pass along the spinal cord, separating from it with the various roots of the nerves, and in their course within the spine mingling more or less with the vesicular matter of the cord. There are, according to this hypothesis, no other fibres but these (save the commissural) and they are sufficient to manifest the physical as well as the mental acts. Nerves of sensation are capable of exciting nerves of motion which are in their vicinity; and they may produce this effect even when the spinal cord has been severed from the brain, for their relation to the grey matter of the cord is such, that their state of excitement is readily conveyed to it.

"3. According to a third hypothesis, it is assumed that all the spinal and encephalic nerves, of whatever function, are implanted in the grey matter of the segments of the cerebro-spinal centre with which they are severally connected, and *do not pass* beyond them. The several segments of the cerebro-spinal axis are connected with each other through the continuity of the grey matter from one to another, and through the medium of commissural fibres which pass between them. Through these means, motor or sensitive impulses may be propagated from segment to segment; and a stimulus conveyed to any segment from the periphery may either simultaneously affect the brain and cause a sensation, or it may be reflected upon the motor nerves of that segment and stimulate their muscles to contract. Or both these effects may take place at the same moment, as a result of one and the same stimulus. According to this hypothesis, each segment of the cord, so long as it retains its proper commissural connexion with the brain (by commissural fibres and continuous grey matter) is part and parcel of the centre of volition, as well as of that of sensation, and the mind is as directly associated with each segment of the cord as it is with any portion of the encephalon. Let that commissural connexion be dissolved, and the mind will immediately lose its hold upon the cord; but the various segments of that organ may nevertheless still be acted on by physical impulses, and may still continue to evolve the nervous force in connexion with the natural changes which may take place within.

"I am not aware that this view of the mechanism of the various actions of the nervous system had been ever distinctly enunciated, before it had been stated by Mr. Bowman and myself, in our work on the 'Physiological Anatomy and Physiology of Man,' in 1845. There is nothing, however, in this hypothesis at variance or inconsistent with the views of Prochaska; for this physiologist seems to have held the opinion, that the nerves are implanted in the segment of the cerebrospinal axis, into which they sink, and do not pass beyond it."

[The reviewer proceeds to say, that the discovery by Mr. Grainger, that from each root of a spinal nerve some fibres were implanted into the grey substance of the cord, and others apparently became continuous with its longitudinal fibres, appeared a very strong argument in favour of Dr. M. Hall's hypothesis. The difficulty is in establishing a direct communication between the cerebrum and the roots of the spinal nerve,—for]

"Although many anatomists still hold to the belief that some of the fibres in each nerve-root are continuous with the longitudinal fibres of the cord, yet this by no means proves that they pass along the cord for any considerable portion of its length, far less that they pass upwards continuously to the grey matter of the cerebrum. And there is a general agreement in the assertion, that the great bulk of the fibres which constitute the roots of the nerves of any segment of the spinal centre, are implanted in the grey matter of that segment, and do not pass beyond it."

[Moreover, it is distinctly shown, the reviewer remarks, that the white matter of the cord does not increase in amount from below upwards, as it ought to do on Mr. Hall's hypothesis, but is greatest where there is the most ganglionic enlargement. He goes on to say,]

"It is pointed out by Dr. Todd, that the only channel by which the will can influence the spinal cord being (as generally admitted) through the fibres of the anterior pyramids, it is highly improbable that these fibres should form the aggregate of those by which the will can exert its influence upon the spinal nerves; the whole of them on *both* sides, collected together, scarcely equalling in bulk the anterior portion of *one* of the antero-lateral columns of the spinal cord.

"From these facts we seem justified in inferring, that the spinal cord is the *chief* centre for the roots of the spinal nerves; that a considerable portion of the white strands of the cord is composed of fibres which are passing a little way upwards or downwards, so as to reach segments of its ganglionic centre a few removes from the point at which the nerves join the cord, just as, according to Mr. Newport, the fibres of the ganglionic column may be seen to do in the articulata; and that if any of the fibrous strands pass continuously between the roots of the nerves and the encephalic centres, the proportion is so small that it cannot be regarded as adequate to supply the demands of Dr. M. Hall's cerebral or sensori-volitional system. We are not disposed, however, to deny the passage of some such continuous fibres; on the contrary, it seems to us that the analogy of the fibrous tract in the articulata is strongly in favour of their existence, and that the admission of them as passing, not to the cerebrum, but to the sensory ganglia, and as forming, not a system distinct from the spinal, but a portion of that automatic system of which the spinal is itself but a part, is almost necessary to our explanation of the phenomena which we seek to comprehend, and at the same time will convert all the arguments in favour of the 'distinct system,' founded upon a somewhat erroneous interpretation of the anatomy and physiology of the articulata, into arguments of support of the simpler view which we shall endeavor to establish.

Another difficulty which we may notice as involved in the doctrine of the "distinct system," has reference to the emotional actions. These were considered by Dr. M. Hall to take place through the instrumentality of the "true spinal" fibres; but reasons were urged by Dr. Carpenter against this doctrine, which rested solely upon the fact that emotional actions may take place in parts which are paralysed to the will. Arguing from the fact that the emotions can only be excited through the sensations, and chiefly through those of the special kind, Dr. Carpenter considered that we must recognise the existence of a third class of fibres, having their special centres in the ganglia of sense, and independent alike of the cerebral and the spinal. Dr. Todd recognises the necessity of this extension of the doctrine of a distinct system, if it be adopted at all, and makes the following just and pertinent remarks upon it:

"It is difficult to admit the existence of three orders of fibres in each muscle, which, to be effective, must have the same relation to the elements of the muscle. It is impossible to imagine how each order of fibre should comport itself with reference to the other two, so that their actions may not interfere. Nor can any one fail to perceive that the emotional fibres must be infinitely less frequently employed than the others, and in some individuals so seldom called into action as to be greatly exposed to the risk of atrophy for want of use."

With regard to the second hypothesis, there is no necessity for any lengthened argument; since the facts already adduced clearly prove that the great mass of the fibres, of which the roots of the spinal nerves are composed, *cannot* pass on to the brain.

The third hypothesis has the recommendation of being much more in accordance than either of the preceding with the anatomy of the spinal cord, as we now understand it; since it regards each segment as the centre of its own proper nerves, all centripetal impressions being received in the first instance by it, and all motor impulses finally proceeding from it; whilst by the connexions established through commissural strands between the different segments of the cord itself, and between the cord on the one hand and the cerebrum and cerebellum on the other, the impressions first conveyed to the cord are carried on to the sensorium so as to produce sensations, whilst motor impulses originating in the cerebrum are brought to act upon the muscles, by being directed to the segment of the cord whence their nerves proceed.

This hypothesis has the great merit of simplicity; for it assumes that all muscular movements, whether reflex, emotional or voluntary, are immediately called into action by the same efferent fibres; and that the very same afferent or excitor fibres are the channels of the transmission of stimuli which give rise to reflex actions through the spinal chord, and of impressions that become sensations when transmitted to the sensorium. The mechanism of reflex action, on this hypothesis, is precisely the same as on Dr. M. Hall's; but the mechanism of sensation and of voluntary motion are at first sight more complex. These phenomena are thus explained by Dr. Todd:—

"The mechanism of a voluntary action in parts supplied by spinal nerves would be, according to this hypothesis, as follows:—The impulse of volition, excited primarily in the brain, acts at the same time upon the grey matter of the chord (its anterior horn), and through it upon the anterior roots of the nerves implanted in it. This grey matter, in virtue of its association with the brain by means of the anterior pyramids, becomes part and parcel of the organ of the will, and, therefore, as distinctly amenable to acts of the mind as that portion which is contained within the cranium. If we destroy the commissural connexion with the brain through the pyramidal fibres, the spinal chord ceases to take part in mental nervous actions; or, if that connexion be only partially destroyed, that portion of the chord which the injured fibres had associated with the brain is no longer influenced by the mind. Again, if the seat of volition in the brain be diseased, the chord, or part of it, participates in the effects of the disease as far as regards voluntary actions. That it is not too much to ascribe such power to the pyramidal fibres appears reasonable, if we consider how the fibres of the corpus callosum, and perhaps other transverse commissures, so connect the hemispheres and other parts of the brain, that the separate divisions of a double organ act harmoniously, so as to excite but a single train of thought, or, conversely, that two impressions from one and the same source, on a double sentient organ, are perceived as single by the mind.

An objection to this explanation will readily be raised—namely, that the excitation of the anterior horn of the grey matter, in the way stated, does not explain the remarkable power which the will has of *limiting* its action to one or two, or a particular class of muscles. To this, however, it may be replied, that there can be no reason for denying to the mind the faculty of concentrating its action upon a particular series of the elementary parts of the versicular matter, or even upon one or more vesicles, if we admit that it can direct its influence to one or more individual fibres, as the advocates of the first and second hypothesis do. If, indeed, we admit the one, we must admit the other; for, whether the primary excitation of a fibre take place in the encephalon or in the spinal chord, the part first affected must probably be one or more vescicles of grey matter.

"The series of changes which would develope a sensation admits of the following explanation, according to this hypothesis:—A stimulus applied to some part of the trunk or extremities is propagated by the sensitive nerves to the *posterior* horn of the grey matter of the spinal chord, and from the junction of this part with the brain either through the direct continuity of the vescular matter of the chord with that of the centre of sensation, by the olivary column, or through longitudinal commissural fibres, analagous to, or even forming a part of, the anterior pyramids, this is simultaneously affected. To this, likewise, it will be objected, that the limitation of sensation is not sufficiently explained. But the reply is obvious; the *intensity* and *kind* of sensation depend upon the nature of the primary stimulus at the surface, the *extent* upon the number of fibres there stimulated. Wherever these fibres form their proper organic connexion with the vesicular matter, that matter will participate in their change to an extent proportionate to the number of fibres stimulated, and with an intensity commensurate with the force of the primary stimulus. It is not necessary to the development of sensation, that the fibre stimulated should be implanted directly in the brain; if it be connected with this centre through the medium of vesicular matter, or through commissural fibres, all the conditions necessary for the development and propagation of nervous force would appear to be fulfilled. It must not be supposed, however, that, in making this statement, we mean to assign the spinal chord to be the *seat* of sensation; all we assert is, that the posterior horn of the grey matter, as being the part in which the sensitive roots are implanted, is the seat of physical change excited by the stimulus applied to the sensitive fibres, which change must be *perceived* by the mind before true sensation can be produced. In fine, by the union of the posterior horns of the spinal grey matter with the vesicular matter of the brain, they become a part of the centre of sensation so long as that union is unimpaired."

Now we are of opinion that there is evidence that the mechanism of voluntary movement is very much what Dr. Todd represents it to be: and that the cerebrum does *not* directly act upon the muscles, but exerts its influence upon that other portion of the nervous centres, from which their nerves immediately proceed. This evidence we shall presently consider. But we cannot find any such indications of an intermediate process in the case of sensation; on the contrary, everything tends towards the conviction in our minds, that the reception of a sensation by the sensorium is a process as direct as the reception of a physical stimulus (as Dr. Todd terms it) by the spinal chord; and, moreover, there is to us ample proof that there is a class of actions as purely "reflex" as those of the spinal chord, in which sensation is a necessary participant. This was long ago seen by Unzer and Prochaska, who very wisely, we think, made their "sensorium commune" include the centres of sensation; and who drew a distinction between reflex actions *with* sensation, and reflex actions *without* sensation, of which not only Dr. M. Hall, but also Dr. Todd, appears to us to have lost sight. As a further elucidation of the nature of Dr. Todd's hypothesis, we shall quote the following passage from his second Lumleian lecture:—

"The brain and spinal cord (and I beg to state that I use these terms to signify respectively the intra-cranial and intra-spinal nervous mass) as the great centres of the nervous system—the great nervous battery of the body—show distinctly a division into two portions; one in which nerves are implanted; the other which has no immediate connexion with nerves, and communicates with them only through the medium of the former part. Thus, in the brain, the hemispheres, the corpora striata, the optic thalamus, the tubercula quadrigemina, and the large mass of vesicular matter connected with them and the cerebellum, have no immediate connection with nerves—no nerve is implanted in any one of these centres.

"The functions of these centres are all of a mental nature,—either the development of intellectual change, or the exercise of volition, or perception, or emotion, or the balancing and co-ordinating of movements,—and they exercise a control over the various segments of that portion of the cerebro-spinal centre in which nerves are implanted, through commissural fibres, which pass from them to the various segments of that centre. That part of the cerebro-spinal axis in which nerves are implanted—which was fully recognized by the distinguished Prochaska, and by him designated the *sensorium commune*—this part is in itself incapable of originating any nervous action, except in virtue of some physical change in it: it cannot develope any mental action except in obedience to a stimulus from some of those centres already mentioned as belonging to the encephalon. This part extends from the upper part of the crura cerebri to the extremity of the spinal cord, and all its actions are physical, unless when excited and guided by any of the encephalic centres. It is the centre of those reflex actions which take place through the spinal or encephalic nerves."

The fundamental principle of Dr. Todd's hypothesis we believe to be perfectly just; and the views of the constitution and actions of the nervous centres which we have now to propound, will be based on a full recognition of it. In fact, it may be regarded as the result of the combination of Dr. Todd's doctrine of the *singleness* of the root-fibres of the spinal nerves, and of the derivation of the power of the motor nerves from the spinal cord alone, with the view of the relative offices of the several divisions of the encephalic centres which was put forth in the pages of one of our predecessors, (Brit. and For. Med. Rev., Oct. 1846;) and, by means of this combination, we find ourselves brought back, with the most singular exactness, to the main positions assumed by Unzer and Prochaska. In fact, we may consider ourselves expounding *their* doctrines, with the additional light derived from our improved knowledge of anatomy, both human and comparative, and the *modus operandi* of the nervous system in general.

The fundamental or essential part of the nervous system, in all animals, is that which responds *automatically* to external stimuli;—that is, the system of *afferent* nerves, by which the influence of stimuli is conveyed from the periphery to the centres; the system of ganglia by which it is received and reflected, without any exertion of intelligence or will; and the system of *efferent* nerves, by which the motor impulse thus called into play is conveyed to the muscles. The automatic action is essentially the same, whether it involves the excitement of sensation, or whether it is performed without any consciousness whatever; the difference depending merely upon the conveyance of the stimulus to a part of the ganglionic centres which is subservient to consciousness, or to the parts which have no such relation. *The nervous system of the articulated animal affords the type of a purely automatic apparatus.* It consists of a series of ganglia connected by longitudinal cords, which pass along the ventral suface of the body; and of a pair of ganglia seated in the head, but connected with the highest ganglion of the ventral series by fibrous cords of precisely similar characters to those which pass between the latter. Each ganglion has nerve-trunks especially connected with itself; those of the ventral cord being distributed to the muscular system and to the surface of the body; whilst those of the cephalic ganglia chiefly serve to connect them with the organs of sense. But the connextions of the nerve-trunks are not exclusively limited to the ganglia of their own segments; for, according to the statement of Mr. Newport, some of their fibres pass along the cord to ganglia above or below, thus forming part of the fibrous strands which connect the ventral ganglia with each other; whilst others are directly connected with the cephalic ganglia, by means of the fibrous column which overlies the ganglionic. This last assertion is doubted by Dr. Todd; but, as it seems to us, upon no sufficient grounds. It is not disputed that the cephalic ganglia are the centres of *sensation*, and that the optic nerves pass directly into them: why, then, should not *other* sensory nerves pass into them with equal directness? Moreover, if some of the fibres of the nerve-roots pass along the interval between one, two, or more segments, to reach remoter ganglia of the ventral cord, why should not others pass along its entire length, to reach the cephalic ganglia? It is distinctly affirmed by Mr. Newport, that he has traced fasciculi of nerve-fibres passing continuously between the cephalic ganglia and the roots of the nerves of the trunk, without entering any other ganglion; and until this assertion has been disproved, we think that Mr. Newport's well known accuracy ought to serve as a warrant for its reception.

But its admission will not by any means involve the doctrine of the "distinct system;" on the contrary, the anatomical study of the nervous system of the typical articulata, and the careful analysis of their actions, lead us to the conclusion that the *whole* apparatus is of an *automatic* character, answering precisely to the "sensorium commune," of Prochaska; and that *all* its actions may be designated as *reflex*, being performed in direct respondence to external, or, as Dr. Todd terms them, "physical stimuli," without any interference or modification (except in those somewhat aberrant forms which most nearly approximate to vertebrata) from intelligence or will. The movements of each individual segment, called into action by external impressions, are immediately dependent upon its own ganglion; but those of the several segments are associated together, partly by the commissural fibres that pass between the ganglia, and in part, perhaps, by the connection of each nerve-root with ganglia above and below; and the guidance and direction of the whole train is effected by the cephalic ganglia, which are called into play by the impressions made on the proper sensory nerves, and which exert their influence by means of the commissural fibres that pass down from them to the ganglia of the central cord. Such we believe to be the mechanism, not only of the ordinary locomotive actions of these animals, but of all those wonderful operations which we are accustomed to designate as *instinctive*. The former chiefly originate in impressions made on the vertral ganglia themselves; and only need the control and direction which the cephalic ganglia exercise over them, in virtue of the sensations received by the latter.

But the "instinctive" operations would seem to be primarily dependent upon sensations, some of them derived from external impressions, but others originating in the body itself; and we regard them, therefore, as belonging to Prochaska's category of reflex actions involving sensation; although they seem to have been considered by Unzer as independent even of sensation. The wonderfully *adaptive* character of these actions is no more reason for considering them as otherwise than automactic, than it is for regarding the ordinary reflex actions as dependent upon the designing will of the individual that performs them; what, for example, can be more nicely adjusted for a special purpose, than the various muscular movements concerned in the act of *sneezing*, which may be regarded as a very good example of the reflex movements with sensation? The close relation, in fact, between sneezing, coughing, and the ordinary movements of respiration, which are all equally *automatic*,—although the first is certainly dependent upon the excitement of a sensation, and the second is perhaps so, whilst the latter are merely (in Dr. M. Hall's phrase,) excito-motor,—strongly indicates the unity of the apparatus by which they are carried into effect; and should of itself lead us to question the correctness of Dr. Todd's complete separation of the sensorial apparatus from the spinal.

Interpreting the anatomy of vertebrated animals, then, by that of the articulated, we should view the spinal cord, the medulla oblongata, and the whole series of ganglionic centres connected with the nerves of sensation, and lying along the base of the skull in man, as far forwards as the olfactive ganglia, as constituting the apparatus of automatic action; and should look upon the cerebrum and cerebellum as organs superadded to this for purposes peculiar to vertebrata, making use of it as their instrument, and not having any communication either with organs of sense, or with the muscular system, except through its intermediation. The proper *cerebral* portion of the nervous system, in our apprehension, consists of the superficial layer of vesicular matter, and of the fibres which connect the different parts of this with each other, thus constituting what Mr. Solly terms the "hemispheric ganglia;" to the exclusion of the thalami optici, corpora striata, and corpora quadrigemina. The hemispheric ganglia are connected with the automatic apparatus by that great series of fibrous communications which pass in a more or less radiating manner from the corpora striata, thalami optici, corpora quadrigemina, and other parts of the summit of the automatic apparatus, towards the vesicular matter of the hemispheres; and here, as it appears to us, rather than in the pyramids are commissures by which the cerebrum is brought into connection with the automatic centres. The pyramids, together with the other fibrous strands of the medulla oblongata, are obviously the homologues of the diverging cords that pass around the œsophagus of articulata, to connect the cephalic or sensory ganglia with the first ganglion of the ventral cord; and we cannot see any reason for regarding them as having any other function in vertebrated animals, than in like manner to connect the sensorial ganglia contained in their cranium, with the spinal cord, which answers to the ventral series of ganglia in the articulata. Interpreting the structure of the spinal cord by the connections distinguishable amongst the latter, we should be disposed to regard *each pair* of spinal nerves, with Dr. Todd, as being especially connected *with its* own segment; but as probably communicating with other segments, above and below, by fibres which enter into the composition of the fibrous columns of the cord; and as having a direct communication also, by continuous fibres, with the sensory ganglia lodged within the cranium. Until such communication shall be disproved, we must regard all analogy as in its favour; for we certainly have no reason to suppose, from any other source of information, that the communication between an organ or surface, possessed of sensibility, and the sensorial centres, is otherwise than *direct.* But we should no more regard the fibres that pass on to the cephalic ganglia as entitled to rank as a "distinct system," than we should consider the fibres that may pass on to segments of the spinal cord, above or below those with which their trunks are mainly connected, as having claim to such a designation. They appear to us to constitute a part of one and the same system of automatic action; the operations of which will necessarily involve sensation, or will be essentially independent of it (although usually accompanied by it,) according as they take place through the instrumentality of the upper or sensorial, or the lower or non-sensorial, portion of the apparatus.

We do not, however affirm that a continuity of *fibrous* structure is necessary for the transmission of nervous agency, or to use Dr. Todd's more correct phrase, for the excitement of nervous polarity. On the contrary, we agree with Dr. Tood that there is adequate evidence that the vesicular substance may be subservient to this purpose. For it has been established by the experiments of Stilling and Van Deen, that both sensory and motor impressions can be communicated from one portion of the spinal cord to another, when sections are made in such a manner as to leave the two portions connected only by grey substance. And in no other way can we account for the *radiation* of impressions, in certain states of exalted activity of the automatic centres; a sensorial impression, for example, in a hysterical subject, spreading from the nerve which conveyed it to many others, so that the slightest touch produces a painful sensation over a large surface; and in like manner, the slightest irritation, in the tetanic state, whether that state be natural or artificially induced by strychnine, serving to throw a large number of muscles into powerful and simultaneous contraction. Still we think it probable that all the *ordinary* automatic movements, especially those most directly connected with the maintenance of the organic functions, *are* produced through the instrumentality of a direct fibrous communication between the part to which the stimulus is applied, the ganglionic centre, and the muscles thrown into contraction. For such direct communication is evident enough in the case of the respiratory and pharyngeal centres in the invertebrata; each of which seems to be the immediate instrument of all the movements for which it is specially provided. And there is no reason why the lodgment of these centres in the medulla oblongata of vertebrated animals should interfere with their directness of connexion, the one with the respiratory apparatus, and the other with that of deglutition. On the contrary, we think that in the fact of the supply of many of the muscles of the lower jaw by *two* motor nerves, the portio dura seeming to be the instrument of their respiratory and expressional movements, and the fifth pair of those of mastication and deglutition; there is an indication that these centres remain distinct, and that their connection with the muscles, as well as with the sensory surfaces, is by fibres of their own.

Referring to the article to which we have already alluded, for various proofs of the existence of a class of actions in man, as purely *reflex* as those to which the term is ordinarily applied, but involving the excitement of *sensation* as a necessary link in the chain of operations,—a class to which we do not perceive that Dr. Todd makes any reference, and the absence of any comprehension of which seems to us to the essential defect of his physiological system,—we have now to inquire into the relation of the cerebral or hemispheric ganglia to the sensory and motor apparatus. That they are not the seat of sensation, and have no participation in purely automatic actions, we believe that there is no occasion to argue; since most comparative anatomists regard the sensorium as seated in the ganglionic centres of the sensory nerves. On the other hand, it is generally admitted that they are the instruments by which ideas are formed, by which reasoning processes are carried on, and by which the will exerts its power. We should expect, then, that they would derive their first stimulus to action from the sensorial centres, which would communicate to them the influence of the sensations therein formed; and anatomy furnishes, as we have already pointed out, the required fibrous connexions. We have dissented from Dr. Todd's notion that the mechanism of *sensation* involves a *double* ganglionic action; but we think that this double action is clear enough in regard to *perception*, or the formation of a notion or idea in regard to the object of sensation, of which the excitement of sensation in the sensorial ganglia is the first stage, this sensation being itself the stimulus to the secondary action of the cerebral ganglia. And in like manner, as we shall now proceed to show, in the performance of voluntary movement; that is, a movement *designed* by the individual to carry into effect a given purpose; the cerebrum does not act directly upon the muscular system, but uses the automatic apparatus as its instrument.

Every one who has attentively considered the nature of what we are accustomed to call *voluntary* action, has been struck with the fact that the will simply determines the *result*, not the special movements by which it is brought about. If it were otherwise, we should be dependent upon our anatomical knowledge for our power of performing the simplest movements of the body. Again, there are very few cases in which we can single out any individual muscle, and put it into action independently of others; the cases in which we *can* do so are those which a single muscle is concerned in producing the result, as in the elevation of the eyelids; and we then really single out the muscle and cause it to contract, by "willing" the result. Thus, then, however startling the position may at first appear, we have a right to affirm that the will cannot exert any direct or immediate power over the muscles; but that its determinations are carried into effect through the intermediation of some mechanism, which without any further effort on our parts, selects and combines the particular muscles whose contractions are requisite to produce the desired movement. This conclusion, at which we arrive by an analysis of our own consciousness, is in perfect harmony with the inferences which we should draw from the anatomical relations of the cerebrum; for we have found strong reason to believe that the cerebrum does not directly transmit any fibres to the muscular system, but that its operations are exerted through those fibres, which pass between the surface of the hemispheres and the chain of ganglionic centres at the base of the cranium that constitutes the summit of the automatic apparatus. And thus, as the sensorium *plays* (so to speak) upon the cerebrum, sending to it sensations in order to call forth its activity as the instrument of the purely mental operations, so does the cerebrum, in its turn, *play* downwards upon the motor portion of the automatic apparatus, sending it volitional impulses, which excite its motorial activity. Thus, then, even what we are accustomed to consider our *voluntary* movements are in their immediate and essential nature *automatic;* their peculiar character being, that whereas the ordinary automatic movements are excited by *external* stimuli, impressional or sensational, conveyed by the afferent nerves, the volitional movements are excited by a stimulus proceeding from the cerebrum, and conveyed along what Reil, with great sagacity, termed the nerves of the *internal* senses.

Our idea of the mechanism of voluntary movement then, is essentially the same with that of Dr. Todd; the chief difference being that *we* regard the automatic apparatus as including that series of sensory ganglia which *he* considers to be an appendage to the cerebrum; so that the real commissures between the cerebral and automatic apparatus are, in *our* apprehension, the fibres of the white substance of the brain, radiating from the thalami optici, the corpora striata, &c.; while in *his* they are the strands of the medulla oblongata, especially the anterior pyramids. Now we cannot but think that, if Dr. Todd will bear in mind the disproportion between the amount of radiating fibres in the cerebrum, and the size of the pyramidal columns, he will see that there is the same difficulty in conceiving that these columns can be adequate to convey the whole cerebral influence downwards to the spinal cord, as he has himself pointed out in the doctrine that they contain all the fibres of communication between the cerebrum and the motor nerves. On the other hand, if we look at the strands of the medulla oblongata as simply commissures between the cranial and spinal portions of the automatic axis, and look upon the cerebrum as connected with the upper end of that axis, by the whole of those radiating fibres which pass from it to the hemispheric ganglia, the anatomical arrangements seem to be in much better harmony with the physiological facts. For there can be no doubt that, in adult man, nearly all the movements not immediately concerned in the maintenance of the organic functions are the result of voluntary direction; the greater number originating in a determination of the will, and the remainder being guided and controlled by it. Consequently we should expect that the connexion between the cerebral and the automatic portions of the cerebro-spinal apparatus should be of the most extensive and varied nature, such as we find to exist in the fibrous portion of the cerebral hemispheres.

The views which we have advanced as to the really automatic character of voluntary movements, and the inclusion of the sensorial centres in the automatic, rather than in the cerebral, division of the apparatus, appear to us to be in most singular harmony with the phenomena of those movements which were not unaptly designated by Hartley as "secondarily automatic," having been voluntary in the first instance, but having been brought by habit into more or less complete independence of the will. Such actions, in fact, take the place in man of those which are primarily and purely automatic in many of the lower animals.

Take, for example, the movements of progression. In the first instance they are performed in sole respondence to the will. Whilst the child is learning to walk, every single effort has a voluntary source; but still its immediate dependence on the automatic mechanism is evident in the necessity for attention to the guiding sensations as the regulators of the voluntary effort. As the habit of movement becomes more and more established, however, we are able to withdraw both the attention and the voluntary effort, to such a degree that at last it is only necessary for the will to start or commence the actions, and to *permit* their continuance. We think that no one can doubt this, who can analyse his own consciousness as to those states of "reverie" in which the mind is completely withdrawn from the contemplation of external objects, and is concentrated, as it were, upon itself. A person who is subject to such fits of "absence of mind," may fall into one of them whilst walking the streets; his whole attention shall be absorbed on his train of thought, so that he is conscious of no more interruption in its continuity, than if his body were perfectly at rest, and his reverie were taking place in the quietude of his own study; and yet during the whole of that time, his limbs shall have been in motion, carrying him along the accustomed path; and his vision shall have given the direction to these movements, which is requisite to guide him along a particular line, or to move him out of it for the avoidance of obstacles. In such a case it would seem as if the contact of the foot with the ground, in making each step, was the stimulus to the next movement; and as if the visual organs exerted just the same automatic guidance over the direction of the progression, as they appear to do in animals which do not possess a distinct organ of intelligence and will. The complete occupation of the mind in other ways, as in close conversation or argument, is equally favourable to this independent action of the automatic apparatus in progression; and many other cases might be cited, in which an habitual train of actions, such as reading aloud or playing on a musical instrument, is not interrupted by the complete withdrawal of the attention and consequent suspension of voluntary effort.

[The reviewer thus sums up the positions which he has endeavoured to establish:]

I. The sensorial ganglia, medulla oblongata, and spinal cord of vertebrated animals; the cephalic ganglia and ventral chain, which are the homologues of these parts in articulata; are the immediate instruments of *all sensorial and motor changes:* and by their sole and independent action are produced all those movements, which, being unprompted by the will, or even taking place in opposition to it, are said to be *automatic.* These automatic movements may be excited either by sensations, or by impressions which do not necessarily affect the consciousness; and this would seem to be the mode in which *all* the actions of insects and other animals destitute of a cerebrum are called forth and directed. The number of purely automatic actions diminishes in proportion to the development of the cerebrum, and to the subjection of the automatic apparatus to its control; but even in man, those most closely connected with the maintenance of the organic functions remain quite independent of the will, and most of them do not require consciousness for their excitation. And when the activity of the cerebrum is suspended or otherwise directed, without any affection of the automatic apparatus, movements which have been long habitually performed in a particular manner may be kept up, when the will has once set them in action, through the automatic mechanism alone.

2. On the other hand, the cerebrum is the instrument of purely mental operations, and has no direct connexion with the external world. It receives all its stimuli to action through the sensorial ganglia; and it exerts all its influence upon the muscular system, through the centres of automatic movement. Hence it may be said to be played upon by the sensorial portion of the automatic apparatus, and to play upon its motor portion. An *idea* with which a pleasurable or painful *feeling* is associated, may act

emotionally (as we say) upon the automatic apparatus, without any voluntary direction, or even in opposition to it. The will may be exerted in antagonizing, strengthening, guiding, or controlling the automatic actions; but in every case, the muscle directly receives its power from the automatic centre; and the very same movement may be automatic, emotional, or voluntary, according as the motor influence has been excited in the centre *from* which the nerve proceeded, by an external stimulus acting through an afferent nerve, or by an emotional impuse transmitted downwards from the senorial centres, or by a volition originating in the cerebrum.—*Brit. and For. Medico-Chirurg. Review, Jan.* 1850, *p.* 3.

11.—ON THE PATHOLOGY OF CONVULSIVE DISEASES.—By Dr. R. B. Todd, &c.

[The following remarks are from an article upon Dr. Todd's theories of convulsive diseases in the British and Foreign Medico-Chirurgical Review. The writer says:]

The following is Dr. Todd's general conclusion in regard to the seat of the morbid affection which gives rise to the epileptic paroxysm:

"The part of the encephalon primarily disturbed, is the hemispheric lobes: if the disturbance do not go beyond a certain point, the phenomena are limited to loss of consciousness and impaired intellectual action, with more or less of sopor. But if the disturbance be considerable, then the tubercula quadrigemina and mesocephale become involved, and *epileptic convulsions* are produced. If the disturbance of this centre be very great, the medulla oblongata and the medulla spinalis become much excited, and the convulsions are complicated with a good deal of the tetanic character.

"We know that there is great variety in the intensity of the epileptic paroxysm, i. e. not only in the intensity and duration of the coma, but also in the violence of the muscular paroxysm. All this depends on the nature and force of the primary disturbance in the cerebral hemispheres, but in all instances the hemispheric lobes are first disturbed; next follow the corpora quadrigemina; and upon the intensity of their disturbance depends the extent to which the medulla ablongata and the spinal cord are engaged."

[On this, the Editor of the British and Foreign Medico-Chirurgical Review observes:]

As our physiological view of the relation between the cerebrum and the ganglionic centres on which it is superposed, differs in some important points from Dr. Todd's, our readers will be prepared to expect that we do not altogether accord in Dr. Todd's conclusion. Looking to the whole assemblage of ganglionic centres interposed between the cerebrum and the spinal cord, as, on the one hand, the centres of sensation (and probably also of the consciousness of the cerebral operations, as well as impressions on the organs of sense,) and on the other, as forming the summit of the apparatus from which motions are directly excited, we cannot but think that they are the parts of the encephalon *primarily* affected, and that the affection of the hemispheres is secondary. For all that Dr. Dodd adduces in regard to the premonitory sensations is best explained on this view; and it is in singular harmony with the fact, that whilst loss of consciousness and convulsive movements are usually combined in the epileptic paroxysm,—the morbid action radiating upwards into the cerebrum, and downwards into the motor apparatus,*—either may occur independently of the other. The loss of *consciousness* is evidently the primary and essential phenomenon; the disturbance of the *intellectual* functions is obviously secondary and accidental.

[The reviewer then gives the following account of Dr. Todd's theory of epilepsy:—]

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* If Dr. Dodd's former assertion be true, that no nerves terminate in the corpora quadrigemina, we are rather at a loss to understand how irritation of their substance can excite convulsive movements, except through the intermediation of the spinal cord or medulla oblongata. Our own opinion has been already stated, that as they are the centres of sensory nerves, so do they give origin to motor fibres.

The epileptic paroxysm is the manifestation of a state of abnormal nutrition of certain parts of the brain, which shows itself in an undue development of their nevous force, or, to use Dr. Todd's language, in a disturbance of their polar state; and this, when it has attained a certain measure of intensity, manifests itself in the epileptic paroxysm, just as a Leyden jar, when charged with electricity to a certain state of tension, gets rid of the disturbance by the 'disruptive discharge.' This state of tension of the brain he regards as resulting from "the accumulation of some material in the blood, which, acting on the brain as a poison, excites this polar state, and this disruptive discharge, and so escapes from the system, leaving the brain free from disturbance, until a fresh accumulation excites a new paroxysm." The infinite variety in the character and violence of the epileptic fits would be accounted for on this view, by variety in the quantity of the morbid material which contaminates the blood, and the different intensity with which it affects one part more than another. In support of this humoral doctrine of epilepsy he adduces the following classes of facts. 1. The influence of certain toxic agents in producing artificial epilepsy. 2. The frequent connection between epileptic convulsions and imperfect eliminatory action of the kidney. 3. The correspondence between the paroxysmal character of epilepsy and that of other diseases confessedly humoral, such as ague and gout. 4. The fact that the introduction of certain animal poisons (as those of the exanthemata or of typhus) into the system, may produce epileptic convulsions.—Of the *nature* of the morbid matter, we can at present only form somewhat vague conjectures. Of its *sources*, however, it is not difficult to frame a more definite idea; since we most frequently find epilepsy to be connected with obviously-disordered nutrition of some important organ, the most common source being the brain itself. Undue exhaustion of the nervous power by anxiety, grief, long-continued thought, masturbation, immoderate sexual intercourse, violent passions, habits of intemperance, or by a sudden shock, directly intend to impair the nutrition of the cerebral matter, and these are among the most frequent causes of epilepsy.

"No doubt, however, there may be other sources of contamination—the digestive organs, the sexual organs, the great glands—which may not only generate morbid matters capable of containing the blood, but may, by the imperfect performance of their functions, weaken or otherwise damage the nutrient changes of the nervous matter, so as to make it more susceptible of the influence of any anxious agent, or to cause it to generate a morbid matter."

Now upon this theory we have to remark, that it seems to us rather unnecessarily complicated. For if we understand Dr. Tood aright, the various mental and physical causes to which the epileptic condition is so frequently traceable, operate in the first instance by producing disordered nutrition of the brain, by this disordered nutrition a morbid product is generated, which contaminates the blood; and this, acting on the brain as a poison, excites the polar state, and the dispruptive discharge. Or the toxic agent may be introduced into the blood, in consequence of the disordered condition of some remote organ. Now here we seem to have *two* causes assigned, when one would seem to be enough. Dr Todd likens the brain to a galvanic battery, of which the blood is the exciting fluid; but he seems to forget that the blood is also the nutrient fluid, out of which the solid part of the battery makes itself. We seem entitled to refer the disorderd function *either* to a disorder of nutrition, *or* to an abnormal condition of the exciting fluid; but it does not seem to us that *both* are necessary to account for the effects. We are accustomed to consider, in every other case, that we have sufficiently accounted for the perverted function of an organ, when we can attribute this to abnormal nutrition; and if it be true that the various causes enumerated by Dr. Todd *primarily* affect the nutrition of the brain, it does not seem to us requisite to suppose that, as a secondary consequence, a toxic agent is generated, which deranges its functions.

The influence of disordered conditions of other organs is as likely to induce impaired nutrition of the brain by a general depravation of the blood, as to occasion irregular excitement by introducing into it a specific toxic element. On the other hand, if we believe the blood to be chiefly in fault, it does not seem to us requisite to suppose that it becomes so, in the first instance, by imperfect or perverted nutrition of the brain, even when its condition is the result of mental agencies; for every one must admit that these agencies can operate upon the blood long before they have had time to induce perverted nutrition of the brain, as we see in the immediate influence of mental emotions upon the chemical nature of the secretions. On the purely humoral hypothesis, then, the disordered state of the blood will be in all instances the immediate cause of the epileptic paroxysm; and this may result from a great variety of causes, mental or physical, without the *nutrition* of the brain being necessarily affected.

[The reviewer proceeds to say :]

Although differing from Dr. Todd upon some points of detail, we are inclined to accept his theory as a whole, and to regard it as an important step towards a right comprehension of this very serious class of maladies. There are two forms of convulsive disease, however, to which he does not make the least allusion, and from the phenomena of which we think that he might have drawn some important inferences in support of his position; these are, Hydrophobia and Hysteria. In *hydrophobia* we cannot but recognise a purely humoral disease. A poison is introduced into the blood, and may remain latent there for days, weeks, and months; but when it does take effect, it is obviously by contaminating the blood, as (to use Dr. Todd's phraseology) the exciting fluid of the nervous battery, rather than as the nutrient pabulum. The mode in which the symptoms come on, and the rapidity with which they are developed after the first manifestation of them, seem distinctly to prove this. There is no reason whatever to suppose that there has been any previous perversion of nutrition; and no morbid appearances indicate the occurrence of any recognisable changes in the nervous centres during the course of the malady. The phenomena of this disease seem to us clearly to indicate an extreme excitement of the upper portion of the automatic centres, namely, the sensory ganglia and the medulla oblongata; this excitement having a tendency to radiate downwards, rather than upwards, so that the cerebrum remains unaffected. In fact, the extraordinary acuteness of certain sensations, and the excitement of convulsive movements by those of the *special* kind, whilst the intellectual powers remain completely undisturbed, which are the characteristic signs of this terrible disease, appear to us almost inexplicable on Dr. Todd's doctrine that the cerebrum is the seat of sensation as well as of intellectual operations, whilst it does not give off any motor nerves. On the other hand, these phenomena harmonise beautifully with the notion, that the sensory ganglia constitute the highest portion of the automatic apparatus; that the convulsive movements directly proceed from them; and that they may be excited by the stimulus of a sensation directly derived from an organ of sense, or by that of an idea or remembered sensation transmitted downwards from the cerebrum. We can scarcely imagine that the idea of the humoral nature of hydrophobia has escaped Dr. Todd's mind; and we presume that he either thought that every one else must be familiar with it (in which case he neglected to avail himself of a powerful argument from analogy), or that he felt himself obliged to exclude it by the limitation of his course to three lectures.

All the arguments which Dr. Todd has drawn in support of the humoral origin of chorea, tetanus, and epilepsy, from the absence of structural lesions, and the influence of causes affecting the general state of nutrition, tells with yet greater force upon the *hysterical* forms of convulsion—those strange manifestations of disordered excitement of the nervous centres, which baffle the sagacity of the best pathologist to account for satisfactorily, and that of the most skilful practitioner to cure. It is well known that chorea, tetanus, epilepsy, and paralysis, may occur as symptoms merely of the general hysteric condition; and the absence of any structural lesion, or even of any seriously-disordered nutrition of the parts of the nervous centres which are the sources of the actions in question, is proved by the length of time during which the severest forms of them may exist without permanently serious consequences, and by the suddenness with which the several forms of them give place one to another, or pass off altogether. The strange combinations, moreover, which they occasionally present, remarkably distinguish them from the more settled forms of the diseases which they simulate. Thus we have known an obstinate case of this kind, in which at one time attacks of the most complete opisthotonos coexisted with perfect insensibility; at another time the insensibility recurred alone; then, again, there was trismus, lasting for five consecutive days, without any other spasmodic action or loss of sensibility; this sometimes alternated with fits of yawning, in which the jaw was held open for half an hour or more; at another period the convulsions had more of the epileptic character, the face being distorted and the limbs agitated, concurrently with insensibility, but without laryngismus; and with this alternated fits of laryngismus without insensibility, and occurring during the *ex*-piratory movement; whilst during the whole of this succession there was paralysis of the extensor muscles of the lower extremities, with paroxysms of the most violent and prolonged cramp in one of them. We do not remember to have heard or read of a stranger variety of spasmodic actions than this, as occurring in the same individual: the mental phenomena were almost equally strange; a state of almost maniacal excitement often suddenly coming on, and ceasing as suddenly; and every form of double consciousness, from simple sleep-waking, to an alternation of two very similar states of mental existence, developing itself at one period after the same fashion.

We have not been able to imagine any other rational explanation of such symptoms, than a disordered condition of the blood, the exciting fluid of the nervous battery; and although we usually find that toxic agents affecting the nervous system are restricted in their action to one or another division of the cerebro-spinal centres, yet it is not difficult to suppose that some kind of morbific matter may affect *any* part to which it may be specially determined; in fact, considering the similarity in structure and in chemical character between different parts of the nervous centres, the wonder is rather that strychnia should fix so exclusively upon one, hydrocyanic acid upon another, and so on.

The clinical history of hysteric convulsion, then, would lead us to imagine that it results from the existence of some morbid matter in the blood, capable of exciting undue and irregular activity of all parts of the nervous centres, but not tending to produce a permanent disorder of the nutrition. Now if we look for the source of this morbid matter, we seem to be directed by the other symptoms towards the sexual apparatus; for although we are not, perhaps, justified in saying that a disorder of the nutritive or secretory functions of this part is essential to the production of the hysteric condition, yet we believe that in all the severest forms of it, the ovarian or uterine functions are imperfectly performed, and that the restoration of their healthful activity is a main point in its cure. Even where mental emotions appear to be the immediate cause of the affection, these emotions are of a nature to affect the due performance of the reproductive functions; and it is well known that the favourable excitement of these same emotions is one of the most valuable means of cure, when it can be judiciously brought about. In the case to which we just now alluded, it was clear that the disorder originated in the disappointment of affections long cherished in secret, although it was doubtless aggravated by anxiety and over exertion of the intellect; and the influence of a very determined will, in keeping off for a time its first access, was equally apparent. The malady resisted every kind of treatment for more than four years; the catamenial discharge remaining very scanty during the whole of that time, and sometimes being absent altogether; and the recurrence of the period being almost invariably marked by an aggravation of the spasmodic attacks, and frequently by pains resembling those of the first stage of labour. A slow and almost imperceptible improvement was taking place, when circumstances occurred to give a new turn to the feelings; a new attachment was formed, which was happily reciprocated; and from that time the cure rapidly advanced, the convulsive and paraplegic affections being speedily recovered from, and nothing being left but dysmenorrhœa, which we have since had reason to regard as dependent upon mechanical causes. It is worthy of notice, that in this case there was an hereditary predisposition to gout, which seemed once to manifest itself in a peculiar affection of the tissues about the wrist-joint, of a character more gouty than rheumatic; in this respect confirming the views advanced by Dr. Laycock, in his work on the 'Nervous Diseases of Women,' as to the connexion between gout and hysteria.

It is due to Dr. Laycock, also that we should state that he distinctly advocated, in the work just referred to, the doctrine of the humoral origin, not merely of hysterical, but of many other forms of convulsive disease, to which he gave the significant term *neuræmic.* We do not know how far Dr. Todd regards himself as original in the enunciation of this doctrine; but we judge from his exposition of it, that he is scarcely aware of the extent to which he has been anticipated by Dr. Laycock. We make these remarks in no captious spirit, but simply because we think it right that in bringing the probability of the humoral origin of convulsive diseases prominently under the notice of our readers, we should not omit to point out that the doctrine was originally promulgated by a sagacious inquirer, at a time when the humoral pathology was not quite so fashionable as it has since become.—*Brit. and For. Med.-Chirurg. Review, Jan.* 1850, *p.* 28.

12.—ON THE PATHOLOGY OF HEMIPLEGIA.—By Dr. W. W. Gull.

[Dr. Gull lays down the following proposition on this subject:—]

"If there be disorganization of the hemisphere, whether affecting the anterior or posterior lobe, and implicating the optic thalamus, or corpus striatum, singly or equally, and if the lesion be of such an extent as to produce hemiplegia, *there will be a greater affection of the upper than of the lower extremity, and a greater loss of motion than of sensation:* and if the lesion has been sudden, and both the upper and lower extremities are completely paralyzed, the leg will begin to improve before the arm, and the muscles nearest the trunk will regain their power first, that is, the deltoid and flexors of the elbow before the muscles which move the fingers. As regards sensation, it is sometimes abolished, as the intelligence also is for a few days following the attack, if the lesion has been sudden, but is soon recovered from, like the recovery of muscular power, *first in parts nearest the trunk,* the first in the leg."

Dr. Gull then goes on to assert, that the *seventh* nerve is subject, like the spinal nerves, to the law of "crossed" action; and that it is usually somewhat affected, though commonly to a less extent than nerves of the trunk. Now, if his opinions are here correctly reported, we cannot regard them as correctly formed. For our own observation entirely accords with the statement of Burdach, that, although the facial paralysis is more commonly "crossed," like that of the body, yet that the exceptions are too frequent to allow this to be stated as a rule. According to Burdach, out of 38 cases of cerebral lesion of one side, the muscles of the face were paralyzed in 28 on the opposite side, in 10 on the same side.—So, again, Dr. Gull asserts that the *third* nerve is an exception to the law of decussating effects, and he gives in his First Lecture an elaborate apology for its being so; yet Burdach affirms that paralysis of the eyelid was in 6 cases on the same side with the lesion, in 5 on the opposite,—paralysis in the muscles of the eyeball in 8 cases on the same side, in 4 on the opposite,—and paralysis of the iris in 5 cases on the same side, and in 5 on the opposite. Dr. Gull states that the facts which have fallen beneath his own observation may be reduced to the following expression:

1. Pupil largest on the side of the disease, vision being lost. 2. Eyes turned from the paralysed side. 3. Ptosis on the side opposite to the paralysis of the extremities and face. 4. Though no obvious affection of the iris or recti may exist, yet a patient may turn his eyes most readily from the affected side, and open the eye widest on the side of the paralysis.

Hence he concludes, that when the third nerve is affected, either slightly or considerably, in ordinary hemiplegia, it is the nerve of the *same* side with the lesion that suffers; whilst the paralysis of the facial and of the spinal nerves is *crossed*. Before such a rule can be established, however, it seems to us that a much larger collection of observations should be made, than Dr. Gull has been able to adduce; and that more than ordinary care should be taken in making such observations.—*Brit. and For. Medico-Chirurg Review, Jan.* 1850, *p.* 44.

18.—ON THE PATHOLOGY OF PARAPLEGIA.—By Dr. W. W. Gull.

[The following abstract of Dr. Gull's observations, is from the British and Foreign Medico-Chirurgical Review.]

Dr. Gull's inquiries lead him to distinguish three forms of paraplegia, each dependent upon a lesion of a different kind, and each distinguished by symptoms of its own. The first of these is *paraplegia resulting from lesion of the cord;* and he affirms in regard to this, that general paralysis of the parts below the injury may equally proceed from it, whether the lesion be confined either to the anterior or posterior columns, or extend through the entire substance of the cord; and that in either of these cases *there is greater loss of motion than of sensation*,—the sensation being frequently little if at all impaired, whilst the loss of motor power is complete,—which he considers to be almost invariably diagnostic of the spinal origin of paraplegia. In proof of this position, he cites a variety of examples of injury and disease of the cord, in which the symptoms have been carefully narrated during life: including the well-known cases of Dr. Webster and Mr. Stanley, one related by Dr. W. Budd, and others recorded or quoted by Dr. Abercrombie; and he afirms, that after an attentive search, he cannot find any cases of uncomplicated pressure or disorganization of the cord, in which the loss of sensation preponderated, or in which there was simple loss of sensation. Dr. Gull adds the following as the confirmatory result of his own observations:

"My attention has now for years been much given to *post-mortem* appearances; but I have not met with cases which controvert my position, nor are there amongst the numerous cases of lesion of the cord which are contained in the records of this Hospital, any which show that one part or column of the cord, when affected, is attended with anæsthesia without loss of motion, though, as we have seen, the reverse often happens."

Dr. Gull remarks, however, that in paraplegia from disease about the spine, the nerves are not unfrequently implicated, near their junction with the cord; and thus we find, on a post-mortem examination, sufficient explanation of what, carelessly observed, might seem to destroy the validity of the distinction just laid down. Thus in the case of Count de Lordat, cited by Dr. Abercrombie, a paralytic affection of the left arm followed an injury to the neck from a fall, and the opposite arm became numb. On a post-mortem examination, however, there was found, not only induration of the cord, but a compact and tendinous condition of the spinal nerves, owing to a thickening of their investing membranes; such as was quite sufficient in itself to account for the anæsthesia.

Pursuing his inquiry, Dr. Gull next calls attention to those cases of paraplegia in which *the loss of sensation is greater than that of motion;* and these he remarks, so far from being anomalous or contradictory to the preceding, naturally arrange themselves into two distinct groups, according to the seat of the lesion which may be either *peripheral*, affecting the nerve-trunks in their course, or *central*, in which case it is encephalic instead of spinal. The former of these groups, constituting Dr. Gull's *second* class of paraplegic diseases,—those, namely, *with preponderating anæsthesia, arising from peripheral causes*,—has been especially noticed by Dr. Graves, who quotes, as one of the most remarkable examples of such peripheral affections, the *Epidémie de Paris* in the spring of 1828, which has been minutely described by Chomel, and which was witnessed and studied by Dr. Graves himself. This curious affection usually began with an extraordinary *exaltation* of the general sensibility, which gave place after a few days or even hours to a general *diminution* of sensibility, and this even proceeded to the extent of a complete *abolition*. The power of motion also declined, but usually in a less degree, and rather subsequently to the loss of sensation than synchronously with it. In most instances recovery took place, though the paralysis was very capricious, vanishing and again reappearing. In some cases, however, the disease went on to a fatal termination; and no lesion whatever of the nervous centres was discoverable. The symptoms were evidently referrable to some general cause affecting the nutrition of the nerve-trunks in general; and the malady had all the characters of a disease induced by the presence of some poisonous agent in the blood.—A case is related by Dr. Gull as having occurred in Guy's Hospital, in which a general numbness of the lower extremities, clearly traceable in the first instance to exposure to cold and damp, continued without any muscular weakness for seventeen years; after which under a repetition of the cause, the numbness extended to the upper extremities, and the power of motion became affected. Symptoms of ramollissement of the cord then supervened, and the patient died: no post-mortem examination was made; but the history of the case affords unmistakeable evidence that the affection was here at first entirely peripheral. He cites another case of the same kind, narrated by Dr. Graves; and adverts to the well-known influence of cold upon the nerves even of parts far removed from the seat of its direct application, as in sciatica from standing on cold stones. Such peripheral affections of the nervous system may be the source of paraplegia; but we scarcely think that he has as yet collected sufficient evidence, that the disturbance of sensibility in such cases is *always* antecedent to that of motor power.

Having thus shown that cases of paraplegia, with prevailing numbness, may arise from causes acting on the nerves themselves, Dr. Gull calls attention in the next place to a third class of paraplegic diseases, resulting from anxiety, mental depression, irregular practices, &c., which are attended with general diminution of the nervous, and especially of the encephalic force; in these also, there is a greater proportional impairment of sensation than in spinal affections, as was pointed out by Mr. Earle, in his valuable paper on Paraplegia; and the impairment of the power of voluntary motion is often in a great degree attributable rather to the want of the guiding influence of sensation, than to any direct loss of motor power.

The gait of such persons, as remarked by Mr. Earle, is very much that of a drunken man; and where the anæsthesia is complete, they are obliged to employ the visual sense as a substitute for the muscular. Thus, says Dr. Gull, "one patient told me he could not walk without looking at his feet, because he felt as if his legs were cut off below the knees; and another, because he had no apparent weight." The peculiar state of the sensation was especially noticed by Mr. Earle, who described it as imparting to the patient the idea of some foreign body, as a glove or stocking, being interposed between the object and the skin. With the numbness, there is yet the perception of pricking or pinching of the integuments; and the numbness generally terminates in an undefined manner about the elbows, and just above, or at the knees. There are frequently, moreover, affections of the special senses, as flashes of light, muscæ volitantes, dimness of vision, and noises in the ear; and one peculiarity noticed by Dr. Gull is, that the most moderate pressure on the nerves, as from lying on the arm in bed, or sitting upon the edge of a chair, will very speedily render the nerve completely anæsthetic. That the seat of this affection is encephalic, rather than spinal or peripheral, appears scarcely questionable; and that its cause is rather a disordered state of the general nutrition, that any special local lesion, such as may sometimes be discovered after death, appears equally probable.

In paraplegic affections, then, in which anæsthesia prevails over loss of power, we must not expect (according to Dr. Gull) to find a local and circumscribed lesion of the spinal cord; but we must examine whether there be any probability of diseased action in the peripheral portion of the nervous system, or whether there are indications of the encephalic origin of the disorder. Between these two, the history of the case will seldom leave us much difficulty in deciding.—There is another form of paraplegia, however, of which several cases have been recorded, and of which five examples have fallen under Dr. Gull's own notice; this, to which he gives the designation of *cervical paraplegia* particularly manifests itself in the upper extremities, the legs being sometimes not in any degree affected, whilst they are always much less so than the arms. The muscles of the shoulder and upper arm are at first implicated, and often alone affected. The disease may begin in both extremities at the same time; or, having begun on one side, may gradually pass across and affect the other. At the onset there may be pain and soreness of the muscles; but after the disease has existed for some time, there is no obvious modification of the sensation. From a careful comparison of the phenomena, Dr. Gull comes to the conclusion, in which we believe him to be perfectly justified by the evidence he adduces, that the disease commences in the *muscular* structure, and that the affection of the nerve is secondary.—*Brit. and For. Medico-Chirurg. Review, Jan.* 1850, *p.* 39.

14.—ON MOVEMENTS OF ROTATION CAUSED BY TEARING THE FACIAL NERVE.—By M. Brown-Sequard.

If the facial nerve of a rabbit or guinea-pig, be exposed at its exit from the stylomastoid foramen, and be then drawn away from the cranium, so as to tear it asunder near its origin, the animal begins in about five minutes to turn itself round and round; the movement being from left to right when the nerve has been thus torn on the left side, and from right to left when it has been torn on the right side. This rotation is generally preceded by convulsive movements of the eyes, of the jaws, and of the head upon the trunk; and the body is then bent (as in pleurostholonos) towards the injured side, by the contraction of all the longitudinal muscles of that side, the power of which is such as to resist considerable force applied to extend them. The movement at first takes place within a small circle; but the circle gradually enlarges more and more, until at last, after twenty or thirty minutes, the animal walks in a straight line. There is no paralysis of any muscles, save the facial. The effect is not produced, unless the nerve be torn close to its origin. In dogs, it almost invariably separates in its course through the aqueduct of Fallopius, and the experiment does not succeed. In rabbits, it is usually successful; in guinea-pigs almost invariably.—When the nerve on the other side also is torn, even after a long interval, instead of the tendency to turn to one side, we see at first a *rolling* of the body on its longitudinal axis, which takes place towards the side last operated on. After this has continued, however, for twenty minutes or more, the animal recovers its feet, and begins to *turn*, as after the first operation, but towards the other side. This movement soon ceases. The turning movement resembles that which results from injury of the medulla oblongata a little in front of the calamus, but takes place in the contrary direction; and the movements produced by the latter method commence at once, and do not cease of themselves like those produced by the tearing of the facial nerve, which obviously acts by producing a temporary *irritation* only.—*Gazette Medicale.—Brit. and For. Med.-Chir. Review, January* 1850, *p.* 249.

15.—ON FATTY DEGENERATION OF THE SMALL VESSELS OF THE BRAIN, AND ITS RELATION TO APOPLEXY, By James Paget, Esq.

[The following paper, Mr. Paget tells us, was recently communicated by him to the Abernethian Society at St. Bartholomew's Hospital:—]

In the least degrees of the disease which I propose to describe, the only apparent change of structure is, that minute, shining, black-edged particles, like molecules of oil, are thinly and irregularly scattered beneath the outer surface of the small blood-vessels of the brain. Such a change may be seen in the vessels of portions of the brain that appear quite healthy, as well in the capillaries as in branches of both arteries and veins of all sizes, from 1-150th of an inch in diameter, to those of smallest dimension.

As the disease makes progress, the oil-particles may increase in number till the whole extent of the affected vessels is thick-set with them, and the natural structures, even if not quite wasted, can hardly be discerned. While their number thus increases, there is, also, usually, a considerable increase of the size of many of the oil-particles, and they may be seen of every size, from an immeasurable minuteness to the diameter of 1-2000th of an inch. In other places. one sees, instead of this increase of scattered oil-particles, or together with it, groups or clusters of similar minute particles, which are conglomerated, sometimes in regular oval or round masses, like large granule cells, but more often in irregular masses or patches in the wall of a great part of the circumference of a blood-vessel.

In a single fortunately selected specimen, one may see, in different branches of a vessel, all these degrees or states of the disease, the less and the more thickly scattered minute oil-particles, the clusters of such particles in various sizes and shapes, and the larger particles like drops of oil.

When the fatty degeneration has made much progress changes in the structure, and, not rarely, changes in the shape also, of the affected blood-vessels may be observed. The chief change of structure appears to consist in a gradual wasting of the more developed proper structures of the vessels: growing fainter in, apparently, the same proportion as the disease makes progress, the various nuclei or fibres are at length altogether lost, and blood-vessels of even 1-150th of an inch in diameter appear like tubes of homogeneous pellucid membrane, thick-set with the fatty particles. The structures of the vessels are not merely obscured by the abnormal deposits: they waste and totally disappear.

The changes of shape which the vessels may at the same time undergo are various. Very commonly, the outer layer of the wall is lifted up by one or more clusters of oil-particles, and the outline of the vessel appears uneven, as if it were tuberous or knotted. Sometimes the outer or cellular coat of the vessels is for some distance raised far from the middle coat, as if it were inflated, and the space between them contains numerous particles of oil; (but, perhaps this raising up of the outer coat is often produced by water being imbibed while preparing the specimen for examination). Sometimes, but I think only in vessels of less than 1-500th of an inch in diameter, partial enlargements, like aneurismal dilatations or pouches of their walls are found.

The vessels most liable to this disease are, I think, the arteries of about 1-300 of an inch in diameter; but it exists, generally, at the same time, in the veins of the same or of less size. As a general rule (judging from the specimens hitherto examined), the disease decreases in nearly the same proportion as the size of the vessels, and the smallest capillaries are least, if at all, affected. But there are many exceptions to this rule; and it is not rare to find vessels of from 1-2000th to 1-3000th of an inch in diameter, having parts of their walls nearly covered with the abnormal deposits.

The principal and first seat of the deposits is, in arteries in the more or less developed muscular or transversely fibrous coat :—in veins, it is in the corresponding layer, immediately within their external fibrocellular nucleated coat: in vessels, whether arteries or veins, whose walls consist of only a simple pellucid membrane bearing nuclei, the substance of this membrane is the first seat of the deposits. In some cases the outer fibrocellular coat of both arteries and veins appear to contain abundant fatty matter. But it is seldom that, in an advanced stage of the affection, any of the several coats of a blood-vessel can be assigned as its chief seat; for even in large four-coated arteries they wholly waste, and their remains appear united in a single pellucid layer, of which the whole thickness may be occupied by the deposit.

The figures represent some of the most usual appearances of the degeneration.

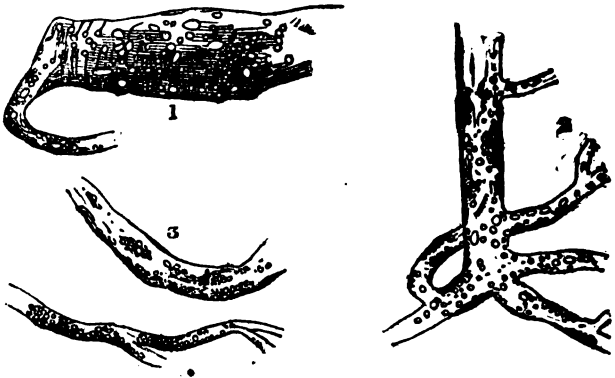

Fig. 1. An artery, of 1-300 of an inch in diameter, and a branch given from it, from the softened corpus striatum in the third of the related cases. Numerous oil-particles of various sizes are scattered in the muscular coat, traces of the tissue of which appear in obscure transverse marks.

Fig. 2. From the same part, a vein 1-600th of an inch in diameter, with branches from 1-1200th to 1-1800th, and portions of capillaries. Scattered oil-particles, and groups, like broken irregular granule-cells, are seen in the homogeneous pellucid walls of all the vessels.

Fig. 3. A vessel of 1-600th of an inch in diameter, and another of 1-1800th, with a branch of 1-3000th of an inch. Groups and scattered oil-particles are thick-set in the simple, pellucid, membranous walls. From the second of the related cases.

The changes of structure just described indicate an affection of the small blood vessels similar in its nature to those which form the large class of "fatty degenerations."

In such cases, when the disease is far advanced in any of the blood-vessels, the loss of their proper structures, and the weakening of the remains of their walls by the copious deposits of fatty matter in them, must make them peculiarly liable to rupture. It cannot but be that this affection should constitute a predisposition to apoplexy, whether occurring in its simplest form or in connection with cerebral softening; indeed, how readily vessels thus affected may be torn, we may see in the frequency with which, in the microscopic examinations of them, specimens of considerable blood-vessels are found torn across at or near the abnormal deposits.

It may assist future researches if I add a short notice of the principal observations that have been lately made on the diseases of the small blood-vessels.

With the exception of the notices of the general dilatation of the small vessels of inflamed parts, scarcely any facts had been recorded in relation to this subject, till Kolliker and Hasse published their observations on the occurrence of "aneurismal capillaries," in a case of acute inflammatory softening of the brain, with capillary apoplexy. This affection, consisting, as the name implies, in partial pouch-like dilatations of the walls of small blood-vessels in inflamed parts, was subsequently observed by them in inflammations produced by severe injuries of the brains of rabbits. Bruch detected a similar condition of the small arteries in a case of traumatic inflammation of the peritoneum of a bitch; and Harting, in a case of diseased ovary. More lately, two cases have been described by Kolliker, and one by Rinecker, in which such aneurismal dilatations existed in the vessels of softened portions of the brain; but, in all these cases the dilatations affected, not the smallest capillaries, but those of largest size and the small veins. In all these cases, also small blood-red points, characteristic of the so-called capillary apoplexy, and usually ascribed to effusions of blood, were found to be the aneurismally dilated vessels full of blood.

I lately observed this kind of dilatation in a case of acute softening of the brain, and could confirm all that Kolliker has described of it; but it existed in comparatively few of the blood-vessels of the diseased part. I have mentioned it, also, as occurring among the vessels of the brain in the second of the cases recorded; and Dr. Ormerod tells me that he observed "fatty degeneration, with irregularly formed vessels and lateral expansions," in the neighborhood of a large collection of pus in the brain. Doubtless, such partial dilatations are very frequent, if not constant, in cases of cerebral softening; but it has yet to be determined whether they are characteristic of inflammation, or whether, as I suspect, they may occur as well in the vessels weakened by fatty degeneration.

Kolliker has recently described a disease, which the names "spurious aneurisms of the smallest arteries of the brain." It consists in effusions of blood between the middle and internal coats of arteries, from one-third of a line in diameter to those of smallest size: effusions resembling those of "dissecting aneurisms." He says that this is, "according to my observations hitherto, the regular forerunner and accompaniment of common and capillary apoplexies." I have too much confidence in the accuracy of Prof. Kolliker to doubt his observations; and though I have seldom, and only obscurely, seen what he describes and figures in his Tab. xix., fig. 1, yet I believe that these effusions of blood in the coats of the smallest arteries may be usual in cases of apoplexy. But I believe, also, that such effusions will be found to be only one of the consequences of previous degeneration of the arterial walls. Without such degeneration, neither the partial rupture of the vessels producing spurious aneurisms, nor the complete rupture permitting the effusion of an apoplexy, is likely to happen.

Respecting fatty degeneration in the small blood-vessels, the only notice I can find is by Virchow, who says he has seen glistening red or yellowish little fat-drops in the epithelial cells of the capillary vessels of the kidney. This, however, must be quite a different affection from that which I have described, and in which the fatty degeneration is seated in the muscular or other corresponding coat of blood-vessels, that, so far as I have observed, have no epithelium. So, too, it is a different, though it may be a related affection, which Rokitansky describes as consisting in the excessive deposit of internal coat in very fine arteries, making their walls thicker, turbid, less transparent and brittle. This affection is well known in the blood-vessels of the brain just visible to the naked eye: it occurs, too, in those of the uterus, mammary gland, and perhaps many other organs in process of senile atrophy. Rokitansky "believes also that he has convinced himself of a similar state in the proper capillary vessels."

It will be observed, that nearly all the observations hitherto made relate to the blood-vessels of the brain. The facility with which those can be separated and cleaned for microscopic examination may explain this: but it is not likely that the brain should be the only organ whose small vessels are liable to these affections.—*Med. Gazette, Feb.* 8, 1850, *p.* 229.

16.—ON THE DIFFERENT TYPES OF DELIRIUM TREMENS, AND THEIR TREATMENT.—By Dr. James Bird, A. M., London.

The most usual divisions of this disease have been into two species; the one succeeding the excitement of hard drinking, without any intermediate abstinence from the accustomed stimulus; the other, attacking habitual drunkards soon after the accustomed stimulus had been withdrawn. The former may be considered as a state of *hyperæsthesia*, and increased vascular action in the nervous centres, or in the remote organs acting on them; the other a state of *hypæsthesia*, or exhausted nervous sensibility, and diminished vascular action of the capillaries, more nearly akin to congestion than inflammation. Dr. Stokes, of Dublin, thinks that the pathological condition of the former consists of gastritis, accompanied by excitement of the brain and nervous system; and recommends that its treatment should be that of gastritis: but that in the other case the functions of the brain are disturbed, by the abstraction of an accustomed stimulus, and that the appropriate treatment must be to restore that stimulus and administer porter, wine, brandy, and opium.

[Dr. Bird classifies the modifications of delirium tremens under four forms, *simple*, *inflammatory*, *pyrexial*, *and epilectic;* and gives a description of the disease generally, and of these varieties, from which the following extracts are taken:]

It is difficult to give any true or concise description of delirium tremens. It may, however, be thus defined.

Def. A disease which manifests itself, after hard drinking, or the long continued and free use of narcotico-stimulant substances; and is characterized by insomnia, exalted sensorial function, rapidity of thought, mental hallucination or illusions of sense, tremor of the tongue or limbs; delirium occasionally associated with inflammation or fever, a cold clammy perspirable state of the cutaneous surface, seldom recovered from without a critical sleep, and prone, in its worst forms, to terminate in coma.

Modified Forms. 1. *Simple.* This must be considered as the purely nervous variety, depending on mere erethism of the system, either of centric or peripheral origin, which runs a certain course, and has a tendency to subside of itself in a given time.

Def. It is marked by insomnia; busy mental excitement and loquacity; psychical hallucination or incoherent muttering; illusions of sense; timid suspicion of imagined conspirators; tremor of the tongue or hands; hepatic erethism or irritability of stomach; impaired urinary function; occasional headache and precordial anxiety; tongue sometimes clean, at others loaded; pulse frequent, irritable, sometimes natural; a perspirable state of the skin, and pain of the limbs: the disease varying by the occasional absence of mental incoherence or tremor.

2. *Inflammatory.* This is the next form of the disease with which we meet in the tropics. It is one marked by a greater degree of vascular determination to the brain and its connexions, or to some of the remote organs, either the stomach or lungs, which may act sympathetically on the nervous centres.

Def. Characterized by great restlessness and impatience of manner; maniacal violence, and busy psychical hallucination or muttering delirium; flushing of the countenance, heat of head, and contracted pupils; convulsive twitching of the muscles, heat or pain at the epigastrium: a frequent, full, or hard pulse; generally a dry hot skin, but sometimes a cool, perspirable, cutaneous surface; a dry, red, parched tongue; and much thirst.

The transition from simple erethism, or disturbed sensation, accompanied by a slight degree of derangement in the capillary circulation of the brain, or peripheral organs, to a higher degree of nervous irritation and increased vascular action, constituting an inflammatory state of either the nervous centres or their peripheries, must be viewed as an important ground f distinction in the various phases of the same disease.

It is important in all inflammatory affections of the brain, and of its subordinate nervous centres, to determine whether nervous or vascular derangement has the precedence; for on the predominance of one or the other, the treatment must be regulated. The primary assimilation of individuals attacked by delirium tremens, will be generally found defective previous to the occurrence of the attack; and as the processes of nutrition, both in the nervous and vascular systems, have been imperfectly performed, it is necessary to keep in mind, that inanition, and other predisposing causes of the disease, are debilitating ones, which give to the inflammation set up, a character of exhausted constitutional power, strongly disposed to pass into suspended functional action of the nervous centres, by terminating in coma, apoplexy, and cerebral effusion. If the attack has been preceded by long-continued habits of intoxication or great mental excitement, this state of innervation and exhausted power will be more apparent in particular symptoms, as the low, muttering character of the delirium; the anxiety of the respiration; the frequency, feebleness, and irritability of the pulse; the pallor of the countenance; the cold and clammy moisture of the cutaneous surface, and the dryness of the tongue. Every increased action and excitement of the nervous centres involves, as would appear, a disintegration of their substance, and corresponding demand of reparation, without which, immediate suspension of their functional operations must follow. Attention to this law of the constitution will be found of great importance, as ground for the modified treatment of this disease.

3. *Pyrexial.* The third form of the complaint, which occurs more generally in the malarious seasons of the year, from July to October, is frequently met with, during the other months, in constitutions rendered irritable by long residence in warm climates, or in persons previously subject to intermittent and remittent fevers.

DEF. It is accompanied by wakefulness, anxiety, and restlessness; following a stage of depression, chilliness, or shivering; succeeded by febrile heat of skin, or cold, clammy perspiration; tremor, muttering delirium, and illusions of sense; frequent sighing; rapid, irritable pulse; furred tongue; scanty urinary secretion; complicated with inflammation and pyrexial paroxysms, and prone to terminate in collapse or epilepsy.

Most of such cases might be viewed as forms of irregular remittent fever, which, accompanied by irritability of the sensorium and nerves, are apt to terminate in suspension of the nervous functions. Among recently arrived Europeans, during the hot weather in India, this form is met with as the product of elevated temperature and excessive spirit-drinking, and assumes many of the characters of an inflammatory remittant, in which accelerated vascular action has predominance over nervous erethism. In the *asthenic* modification of it, however, the vertigo, dilated pupil, oppressed and weak pulse, and other symptoms of depressed nervous energy, (which characterize cases of delirium tremens,) with a well marked tendency to syncope and feeble action of the heart, point it out as a disease of innervation. Modifications of this variety in debilitated constitutions, rendered irritable by long residence within the tropics, are also frequently met with during the cold months. In a practical point of view, it is useful to arrange such cases as modifications of delirium tremens; for though, with equal propriety, they might be classified as varieties of remittent fever, they should be separated in the mind of the physician, from more pure remittent fevers, caused chiefly by malarious influence.

4. *Epileptic.* This is the fourth and last form of the disease.

DEF. Insomnia; psychical hallucination, or illusions of sense; extreme tremor; and sometimes convulsive twitching of the muscles, passing into sudden loss of consciousness and sensation, accompanied by clonic spasms of the muscles, recurring in paroxysms, which terminate in recovery of consciousness and sensation, or in apoplectic annihilation of the cerebral functions.

[Passing over, from want of space, Dr. Bird's account of the differential diagnosis and pathology of these forms of disease, we come to the *Treatment*. Upon this subject Dr. Bird says:]

The indications of judicious treatment must be founded on a correct diagnosis of particular cases, and on a sound knowledge of the existing pathological conditions associated with the morbid phenomena. Such can be alone obtained from a strict pathological analysis of the symptoms, combined with a knowledge of the previous habits of the patient. It should not be too hastily inferred, that the sole and leading indication of the treatment must be to induce sleep by heroic doses of opium; for this, when given too largely in order to cut short the exalted sensibility of the brain, without reference to the conditions of other remote organs, particularly the liver and kidneys, is fraught with much danger to the patients, by causing convulsions, coma, and death. Dr. Ware's two admirable memoirs on the 'Natural History and Treatment of Delirium Tremens,' are most important contributions to a philosophical knowledge of the disease; and the conclusions arrived at are essential elements in our comprehension of its true pathology and treatment. The paroxysm of the disease commences with certain obscure signs of depression, followed by excitement and delirium, which run a certain course, and terminate in sleep. This may be considered as much sequent of the stage of excitement, as is the secondary delirium to the stage of coma in cases of poisoning by stramonium. As a favorable termination of the symptoms generally follows a sound sleep, it has been concluded, somewhat erroneously, that sleep, induced by whatever means, is the cause of the salutary change which takes place, and by which the patient is relieved from excitement, and restored to reason. A profuse warm sweat may be observed to accompany this critical sleep; but when no such crisis is observable, and sleep has been procured at all hazards by means of large doses of opium, the patient passes into a state of apoplectic coma, from which he may never awake. The excitement of the system does not altogether depend on the loss of sleep; and we must not proceed too vigorously in endeavoring artificially to induce it by means of opium or chloroform, till the impaired secretory and excretory functions of the body have been restored to healthy exertion.

The indications of treatment to be generally acted on are: 1. To allay the exalted sensibility of the central nervous organs or their peripheries, by reducing vascular derangement and inflammation by means of mild antiphlogistic remedies, and by the removal of all irritating diseased secretions of organs that react on the brain. 2. To restore the organs of assimilation to a healthy condition, so as to supply fresh nutrient materials to the blood; and to prevent nervous exhaustion by a moderate allowance of stimuli, combined with such materials. 3. To eliminate poisoned products from the blood, by restoring the proper excretory functions of the liver and kidneys.

In fulfilling the first indication, it will be prudent to seclude the patient in a quiet and partially darkened apartment, and let him be watched by some well instructed nurse or attendant, who is capable of quieting his impatience, and can manage him without physical restraint. I have known many cases, in which the mental emotion and nervous exhaustion, caused by coercion, were followed by the utmost danger to the patient, by bringing on an epileptic seizure. In particular instances, where the vascular action preponderates over the nervous erethism, the cautious use of general or local bleeding is admissible; but it must be remembered, that, though in such instances of inflammatory or pyrexial complication, blood-letting may be had recourse to, it must be used sparingly, as having a natural tendency to aggravate the nervous erethism, and those symptoms of exhaustion with which the disease is so usually associated. In most cases, therefore, the local application of ice or cold douche to the head is a preferable and safer means of subduing the cerebral sensibility and increased vascular action, which are so characteristic of this peculiar disease. The cold douche may be repeated three or four times in the day; and frequent general cold affusion, where the temperature of the skin is not below the natural standard, the pulse is of moderate strength, and there are no local complications, is had recourse to in India with the best effect. In many cases, even where there were indications of a feeble circulation, but much cerebral excitement, I have seen the cold douche to the head used with most beneficial effects, while the rest of the patient's body was immersed in a warm bath. The water used in India, where the mean temperature is high, was never artificially cooled; but when used in European climates, particularly in winter, it may be prudent, occasionally, to take off the extreme chill of the water before using it. In further fulfilment of this indication, the administration of tartar emetic solution, in the proportion of half a grain of the tartrate of antimony with a drachm of the tincture of opium, and an equal quantity of nitrous ether, may be had recourse to with the greatest advantage in allaying the excitement of the brain, and in inducing a healthy secretory action of the skin and kidneys. When the biliary secretion is morbidly increased, emetics will be found of the greatest use in relieving the stomach from the irritation of unhealthy bile; and should purgatives be thought more applicable, calomel in large doses, or combined with antimonials and opium, followed by castor oil, may be advantageously employed. Sometimes the exhibition of stimulating enemata after the calomel and opium may be preferred to purgatives, which, when used too freely, are apt to produce an increase of excitement.

The fulfilment of the second indication is to be accomplished by administering moderate quantities of thin sago or arrow-root, combined with wine or brandy, according to circumstances. From five or eight ounces of port wine in the course of twenty-four hours, with occasionally a quarter of a pint of brandy or gin, adapted to the greater or less nervous exhaustion of the patient, will be generally found sufficient to fulfil all that is here required in particular cases. Should the appetite, as is often the case, admit of more solid ingesta being used, mutton chop, grilled chicken, etc., may be given to the patient.

The third and last indication, that of removing poisoned elements from the blood, is partly effected by the latter part of the first indication of removing irritating secretions from organs that react on the brain. The special object in view, however, should be steadily promoted by freely administering calomel, aided in its action by diuretics, in order to restore the impaired excretory functions of the liver and kidneys, and thus eliminate urea from the blood. In cases of peripheral erethism, arising from the retention of biliary matters, calomel will be found an invaluable remedy; and Mr. Corfe's late experience of its good effects, in cases of this kind, and of deranged gastro-hepatic function, establishes the fact, that it will succeed in subduing general erethism after all other remedies have failed. The whole of my experience in India can bear testimony to its good effects, and would justify Mr. Corfe's well-grounded reliance on this as a special remedy. More might be added as to the relative value of particular remedies' but enough has been already said practically to guide the judgment of all who may be called on to treat the disease.—*London Jour.*, *May*, 1850, *p.* 419.

17.—ON THE PATHOLOGY OF DELIRIUM.—By Dr. R. B. Todd, F. R. S.

[The Lumleian lectures for 1850 have been devoted by Dr. Todd to a discussion of the pathology of delirium and coma, a subject which has never hitherto been fully investigated. The two conditions referred to, have usually been attributed, as Dr. Todd remarks, to various degrees of congestion of the brain, but no attempt seems to have been made to ascertain how far this supposition may be correct. Dr. Todd observes:]

Coma, in its most profound state, may be defined as a complete suspension of that mutual influence of the mind and of the organ of consciousness, in which, speaking physically and physiologically, our consciousness exists—a suspension which, no doubt, begins with the physical organ, and therefore involves the powers of thought and of perception, so that the comatose patient neither wills, nor feels, nor thinks, and he awakes from this state as from a deep sleep: he knows not where he had been, and he feels as if during a certain interval he had ceased to exist.

The state of delirium, in its highest degree, is a complete disturbance of the intellectual actions; the thoughts are not inactive, but rather far more active than in health: they are uncontrolled, and wander from one subject to another with extraordinary rapidity; or, taking up some single subject, they twist and turn it in every way and shape, with endless and innumerable repetitions. The thinking faculty seems to have escaped from all control and restraint, and thought after thought is engendered without any power of the patient to direct or regulate them. Sometimes they succeed each other with such velocity, that all power of perception is destroyed, and the mind, wholly engrossed with this rapid development of thoughts, is unable to perceive impressions made upon the senses; the patient goes on unceasingly raving, apparently unconscious of what is taking place around him; or it may be that the senses have become more acute, and that every word dropped from a bystander, or every object presented to his vision, will become the nucleus of a new train of thought, and moreover, such may be the exaltation of his sensual perception, that subjective phenomena will arise in connection with each sense, and the patient fancies he hears voices or other sounds; ocular spectra in various forms and shapes appear before his eyes, and excite to further rhapsodies of thought.

If, then, these states of coma and delirium invole so complete a departure from the normal condition of the consciousness and intellect, and if, as experience teaches us, they are apt, one or other, to accompany diseases of organs other than those which form part of the nervous system, surely nothing can be of higher practical moment than that our views of the pathology of these states—of the precise nature of the derangement of the physiological action of the body, which is capable of producing them in their various degrees;—I say, surely nothing can be more important, practically, than that our views upon these points should be definite and settled. Such derangements as these, affecting as they do, in the most serious manner, both consciousness and the power of thought, must lie at the very foundation of our knowledge of the derangements or diseases of the nervous system.

Can it be expected that we shall be able to form any correct idea of the effects which inflammation or other diseases of the brain is capable of producing, if we know nothing of the intrinsic nature of those conditions which give rise to coma or to delirium.

Delirium occurs under such a remarkable variety of circumstances, in such various conditions of the system, that I find it impossible to give anything like a connected view of the subject without describing the several forms of it *seriatim* as we meet with them in practice, and arranging them in the following order:—

First, I shall describe what may, I think, be properly called the *epileptic delirium.* I do not think that this form of delirium is sufficiently appreciated by practical men. It seems to me to be of frequent occurrence, and that in some of those instances in which, under some sudden impulse, persons are led to commit some dreadful deed, which is opposed to the whole tenor of their previous lives, it is the sudden access of epileptic delirium which has thus disturbed the balance of their moral nature.

I shall describe the phenomena of this delirium from some cases which I have witnessed. A man, hitherto healthy, fails somewhat in health, becomes dull and melancholy—takes a gloomy view of things—but still his ill health is not sufficient to prevent him from following his usual avocation, nor is it noticed by any, save perhaps those who are constantly with him. There may or may not be some cause for this—some excess—or some mental trouble or anxiety—some altered position of his affairs.

Presently, either at night or on first waking from sleep in the morning, or it may be while he is at his usual employment or business, he becomes strange and incoherent—talks at random—mistakes things and persons—writes odd letters: in short, he displays unequivocally by words and actions that the mind is disturbed.

This state of delirium may speedily end in an ordinary paroxysm of epilepsy, with all its accompaniments, after which the patient resumes his wonted health; or it may continue for a considerable time, assuming even the characters of violent mania, with sleeplessness, exciting the utmost terror among the patient's family and attendants: it may last even for days, and then the occurrence of an epileptic fit relieves all doubts as to the nature of the maniacal paroxysm.

It may be, however, that these phenomena will occur with a patient who is subject to epileptic attacks, in which case, if the fact be made known to the medical attendant, he will have the less difficulty in recognizing the true nature of the paroxysm. And it may also happen that the delirium may pass off, or it may terminate in coma, from which the patient may waken up restored without, in either case, the occurrence of any *convulsive* attack of epilepsy.

The delirium, in cases of this description, is in general of the most decided kind; and it often amounts to mania. The patient is wakeful, noisy, sometimes mischievous, sometimes muttering and incoherent, and unintelligible; sometimes distinct and easily understood, the subject of his ravings being determined by circumstances or events which had previously more or less occupied his mind. This form of delirium is not accompanied by any particular constitutional disturbance; the pulse is accelerated, but not to any great extent; its range ordinarily is from 80 to 100; it exhibits no character of strength, but is often full and throbbing.

The effects of any long continuance of this delirium are to induce exhaustion,—as, indeed, is the case with all forms of delirium; and patients sometimes die suddenly, even when they seem to be on the road to recovery. Hence they require the closest attention on the part of the attendant, to prevent undue exertion.

A peculiar feature of this form of delirium is that it comes on suddenly, without previous disorder, or without warning of any kind, as the epileptic paroxysm does. A man may be in perfect health to all appearance, and within five minutes a furious and dangerous maniac. A remarkable case of this occurred to me in a medical gentleman, who was well known and much respected: he was a bachelor, about 45 years of age: he had evinced no particular symptom of illness but suffered some degree of mental anxiety. One afternoon, having been engaged that day to dine out, he went up to his dressing room to dress, and within five minutes his housekeeper was attracted to his room by a noise, and found him sprawling on the floor in a paroxysm of mania, shouting at the highest pitch of his voice, as if he had been assaulted by thieves. This case soon proved itself to be of the epileptic kind.

I shall mention another similar case which came under my care. A respectable, well conducted man, about 35 years old, became, without any assignable cause, delirious at night. It was distinctly ascertained that he had not been drinking, nor had he been overworked; but his wife thought he had been depressed and dull for the three or four days before the attack. A neighbouring medical man bled him moderately, but without effect on the delirium. He was brought to King's College Hospital in a state almost maniacal, and it was thought necessary to restrain him by the strait-waistcoat. When I saw him on the following day, I viewed the case as likely to prove of the epileptic kind. I removed all restraint, and, although much pressed to adopt an opposite line of treatment, I gave stimulants and opium. Under this treatment the delirium gradually subsided, and on the following day the patient had a severe epileptic fit, which was followed on subsequent days by several others.

A third case is as follows:—A man, aged 24, a tailor, temperate in his habits, and previously healthy, has had a hesitation in his speech since his childhood. On the 10th of May, whilst at work, he was seized with giddiness and confusion of ideas. He ran out of the house in which he worked, and without knowing what he did, ran up and down the street, talking strangely. He continued in this state for a quarter of an hour, and then came to himself, feeling for some time afterwards depressed and shivering, with a mistiness before his eyes. Next day he was attacked again with the same symptoms, but in a less degree, and he was admitted into the hospital, where, under a course of purgatives and a regulated diet, there was no return of the attack.

A country carman was walking alongside of his horse through the streets in the neighbourhood of King's College Hospital, when he was observed by the policeman on duty to look bewildered, and to be unconscious of where he was going: he gave incoherent answers, and was evidently quite astray in his mind. On the policeman interfering to bring him to the hospital, he resisted with violence, and became quite furious. In this state he was admitted, and it was found necessary to restrain him: he continued violently delirious for about twenty-four hours, and then fell into a comatose sleep, from which he recovered in twenty-four hours more without any other treatment than shaving the head and keeping it cool, and the use of purgatives by enema and afterwards by the mouth. When this man recovered, we learned that he had never had any similar attack previously, nor was there any evidence of intemperance.

I am frequently in the habit of seeing a pale delicate lad, with large head, who about once in three months, whilst at work, is seized suddenly with giddiness and confusion of thought, followed by a delirious state, in which he talks incoherently, and his pupils become largely dilated; the delirium passes into a state of stupor and drowsiness, and considerable weakness. Purgatives and tonics appear to exercise a beneficial influence upon him, and while he perseveres in the use of steel and quinine, the intervals between the attacks are lengthened.

When delirium occurs with patients subject to epileptic fits, it precedes or follows the paroxysm, or both precedes and follows it for very variable times. Sometimes the delirium ushers in the fit, and the patient is violently maniacal for some time previously; at others, the patient comes out of the fit in this state, which lasts a longer or shorter time, the duration of the delirium varying in both cases from some hours to several days.

The frequent repetition of the attacks in this form of delirium kills by exhaustion; or a single attack, if of sufficiently long duration, may kill in the same way: or the patient may die in, or immediately after, the epileptic paroxysm; but in all cases the immediate cause of death seems to be a state of exhaustion induced by the violent exertion of the patient either in the delirium or in the epileptic paroxysm, or more rarely a state of depression accompanying the invasion of the delirium; or, in cases where there is no violence nor any convulsion, as if the immediate cause which determined the delirious state also exercised a depressing influence.

Now we must particularly notice that this delirium may pass off, leaving the patient in his normal state, with more or less of exhaustion, just as he would be after a common epileptic fit; or, if it end fatally, it leaves no lesion of the brain which is at all adequate to cause death—no softening nor other alteration of texture. In recent cases, indeed, the brain appears quite normal, with the exception of some variation in the quantity of blood in the blood-vesssels, dependent on the circumstances which immediately preceded death. As a good example to show that such an apparently normal state of the brain is quite consistent with severe and long-continued epileptic delirium, I shall adduce the sequel of one of the cases to which I have already referred. The patient, Wm. Measures, was admitted in violent delirium. At the end of the second day, as this was subsiding, he had two epileptic fits, one of which lasted half an hour—the second, five minutes. On the two following days he had a recurrence of the fits, which increased his exhaustion. In the evening of the fifth day he went off into a sleep so tranquil that the nurse did not wake him to give the stimulus ordered for him (℥ij brandy, om. horâ,) and he died rather suddenly during the night. The brain was very carefully examined after death, and no morbid appearance whatever was discernible; the Pacchionian bodies were well developed, and the grey matter of the convolutions and elsewhere was pale; in all other respects the brain was one which no anatomist could regard otherwise than as healthy.

I shall have again to allude to this pallor of the grey matter as the most remarkable and the most frequent appearance which the brain presents after death from delirium. Sometimes there is with it a large quantity of subarachnoid fluid; at other times there is a total absence of that fluid: so that the pallor of the grey matter which one might be tempted to attribute to a post mortem infiltration by the subarachnoid fluid, has really no connection with it.

Renal epileptic delirium.—In some of these cases of epileptic delirium we find albuminous urine, either only at the commencement of the attack, and disappearing as it goes off—which I take to be the least frequent occurrence—or lasting throughout it and after it, and indicating the probable previous existence of chronic renal disease. These are true epileptic cases; but imperfect action of the kidney may be justly regarded as a highly probable exciting cause; and so frequently do they occur, that in every instance of delirium, especially of the epileptic kind, the practitioner ought to inquire early into the state of the kidneys by careful examination of the urine. Whether a morbid state of the kidneys may properly be looked upon as the determining cause of the epileptic state and of the delirium, is a question which I shall reserve for another part of this inquiry; suffice it now to say, that the ascertained co-existence of renal disorder with epileptic delirium is an important feature of such cases, and that clinical research leads us to regard it as an unfavourable omen with reference to the issue of the case. For these reasons I propose to distinguish this affection by the title of *renal epileptic delirium.*

George Addis, æt. 43, of intemperate habits, who followed the occupation of a waiter at places of public entertainment, had been in a low gloomy state for some time, in consequence of having been robbed of a sum of money which he had saved. One evening, whilst performing his duties as a waiter, he became incoherent and odd in his manner, and let a tray of glasses fall from his hands. Soon after this he had two or three epileptic fits, and a day or two following he was sent into the hospital. On his admission he was quiet, but not coherent, rather inclined to sleep. On that day, the 1st of December, he had two epileptic fits of short duration. Next day he remained in much the same state, a little more excited, and knocked his head frequently against the wall or bed; fidgetting about in the bed, and staring about him in a vacant manner; at night he became so restless as to require the constant attendance of one person, and he was noisy. Next day he became still more noisy, appearing scarcely sensible; he was evidently unable to continue any train of thought. On addressing him loudly he would begin the answer to a question correctly, but soon pass to some other subject, or become sleepy.

On the fourth day from his admission the epileptic fits recurred, and he became comatose in the intervals, and much prostrated, and died in the coma succeeding the fit.

From the time of his admission the urine was highly albuminous. The brain, upon careful examination, afforded no mark of disease; the membrranes were healthy; the grey matter of the convolutions pale. There was slight hypertrophy of the left ventricle of the heart, and some puckering of one of the aortic valves. The kidneys exhibited an early stage of chronic nephritis.

Delirium in chorea.—Delirium occasionally occurs in the allied malady of chorea. In the cases of general chorea it is developed in the latter stages of those violent shakings which kill the patient by exhaustion.

I have met with one case of severe delirium which was ushered in by symptoms of chorea, and was successfully treated on a plan similar to that which I have adopted with benefit in severe cases of chorea.

The patient, Benjamin Channon, æt. 20, was admitted Jan. 27, 1847; by occupation a saddler; never had epilepsy, but eleven years prior to his admission had chorea, which affected his intellect to such a degree that he became almost idiotic, and was under treatment for three months in the Middlesex Hospital, leaving it perfectly restored. Seven years afterwards he had another slight attack without any impairment of intellect. A month before his admission the choreic symptoms began to re-appear: the first indication being fidgetty movements of his fingers, which were soon followed by the characteristic jerking movements of the upper and lower extremities, especially those on the right side, and also of the muscles of the mouth.

These symptoms having continued for a month, on the morning of the 26th January he suddenly took it into his head that a conspiracy had been formed against him: he jumped out of bed, and rushed down stairs into the street in his night-shirt; he was with difficulty captured, and brought to the hospital in a state of furious and frantic delirium, talking and shouting out, and sometimes he would quote Shakspeare, in whose writings, it appears, he was learned: then he would sing and whistle; again he would assume an angry mood, and bite and snarl at all who came near him, and at the bed-clothes, and the straight waistcoat with which he was restrained. The choreic convulsive movements were still present, and he put out his tongue with that peculiar thrust which is characteristic of this disease.

This state of delirium lasted several days, and was accompanied with such great exhaustion that I was compelled to administer food and stimulants very frequently, and in considerable quantity. To a treatment of this kind, to which was added cold affusion twice a-day for three or four days, —a plan which I was led to adopt from the idea of a connection of the delirium with chorea,—the symptoms yielded steadily, so that in a fortnight all signs of delirium had disappeared and in a month, the choreic symptoms had completely vanished.—*Medical Gazette, April* 25, 1850, *p.* 703.

Hysterical delirium.—Not far removed from the epileptic delirium is that which occurs in aggravated states of hysteria, and which is well known to practical men as *hysterical delirium*, and which frequently assumes a chronic form, when it may be properly called *hysterical mania*.

The following sketch will, I think, embrace the leading particulars of the clinical history of this interesting malady:—

A girl of hysterical constitution had been somewhat out of health without, it may be, any very prominent symptom, excepting, perhaps, headache; her spirits are more or less depressed, and she shows some tendency to hysterical paroxysms—she may have one or two: presently she does not so readily as usual recover from one of these; she becomes odd in her manner —obstinate—talks at random—refuses food—and she is now evidently delirious, which may be accompanied with more or less of stupor and indifference to all around, or may be violent and furious: she will try to get out of bed—be mischievous—attempt to injure herself or attendants—wakeful; and in such cases it is that the patient will act and talk in a manner apparently the most repugnant to the character and reputation she had previously enjoyed, or the real defects in her character: her real inclinations which principle, or prudence, or cunning, had taught to overcome or conceal, will become developed, and she will be obscene or amorous, or exhibit violent hatred towards others, or other feelings to them: it may be that she will now speak the truth, which before she did not venture to do:—*in delirio veritas*, as in *vino veritas*.

In many instances the paroxysm of hysteria is accompanied by delirium of greater or less intensity, which comes on and goes off with the paroxysm, or remain for some time after it, or may precede it; and this form of hysterical delirium obviously resembles the epileptic, in the relation which it bears to the paroxysm, just as the hysterical paroxysm often resembles the epileptic, so closely that it is impossible to distinguish the one from the other.

This form of delirium is not often fatal. If not treated on a depressing or lowering plan, its tendency is to recover, or to pass into a chronic state, from which the patient may emerge in safety, or may become hopelessly lunatic.

Men are liable to a form of delirium which bears a close analogy with the hysterical delirium of women, and which there can be no doubt is instrinsically of the same nature. I have seen it in over-worked professional men, in students, and in hard-working artizans, even when of temperate habits.

Puerperal delirium.—I shall next notice the delirium which accompanies the puerperal state, which resembles very closely hysterical delirium, and is no doubt essentially of the same nature. It is well known under the name of puerperal mania, or puerperal insanity; but although this title may justly be given to some of the cases which are very chronic, it seems to me that it is quite as erroneous to say of patients who had suffered from this form of delirium, that they had once been insane, as to class among lunatics patients who had once suffered from the delirium of typhus or of erysipelas.

The clinical history of this form of delirium is told in a few words.

It occurs generally soon after parturition, and during suckling; rarely during the latter months of pregnancy.

It is most frequently brought on by some mental emotion, or by some great exhaustion,—as from a lengthened labor, with a dead child, or profuse hemorrhage, or by the debility induced by suckling in a feeble constitution.

It is apt to occur in women of hysterical constitution; but it may be developed in persons with whom the marks of that state of constitution are not prominent.

As in other forms of delirium, the mental disorder appears to be very various, from slight raving to the highest degree of fury, or from slight melancholy to a state of depression and dullness almost amounting to coma.

The greatest number of cases of puerperal delirium recover. Dr. William Hunter pointed out the very important practical fact that it is the amount of fever, or rather perhaps the rate of pulse, which may be taken as the best guide in forming the prognosis. Although I have not seen this form of delirium on an extensive scale, I have seen enough of it to lead me to believe that Dr. Gooch gives a perfectly accurate account of it, when he says that there are two forms, the one attended by fever, or at least by a rapid pulse; the other accompanied by a very moderate disturbance of the circulation; and that the latter cases, which are by far the most numerous, recover; that the former generally die. These are the cases which are in the greatest danger, and which require the most constant vigilance on the part of the medical and other attendants on the patient.

There are, however, as Dr. Gooch remarks, some other circumstances to be taken into the account of the prognosis. Thus the early appearance of the delirium after delivery, especially if it be of the maniacal kind, is more dangerous to life than its late appearance, and its being of the melancholy kind. "Nights passed in sleep, pulse slower and firmer, even though the mind continues disordered, promise safety to life. On the contrary, incessant sleeplessness, a quick, weak, fluttering pulse, and all the symptoms of increasing exhaustion, portend a fatal termination, even though the condition of mind may be apparently improved."

Dr. Gooch adds, that, in the cases which he has seen to terminate fatally, the patient has died with symptoms of exhaustion, not with those of oppressed brain, excepting only one case. One of my own cases died apparently from the exhaustion, caused by removing the patient from her bed, which was done with great care, in order to have her cleaned and the bed made.

In examining the heads of patients who die of this disease, we fail to discover any distinct evidence of special lesion, either of the brain or its membranes, excepting in cases where some previous disease of the brain had existed. In those fatal cases recorded by Dr. Gooch, no morbid appearance was found other than that which follows loss of blood. Esquirol makes this statement:—The examination of the bodies of those who have died, whether recently confined or nursing, after having been a longer or shorter time disordered in mind, discovers nothing which throws light upon the material cause, nor upon the seat of this derangement (tom. i. p. 224).

Anæmic delirium.—The next form of delirium which I shall notice is that which arises from deficiency of blood, or what I may call *anæmic delirium.* It may arise where the blood is imperfectly formed or where the system has been subjected to great losses of blood. Thus in some cases of extreme chlorosis we meet with delirium which is apt to assume the manaical character; and, on the other hand, it may arise in cases of profuse menstruation or menorrhagia. Some of the cases of hysterical delirium are nearly allied to this; and if the hysterical diathesis exists in a patient subject to excessive losses of blood, it will predispose to this form of delirium.

Again, many of the puerperal cases of delirium are clearly attributable to the exeessive losses of blood from hemorrhage, or from unduly active depletion by leeches, or by general bleeding. Dr. Marshall Hall lays it down, and, I think with great justice, "that loss of blood is by far the most frequent and influential source of delirium or mania occurring in the puerperal state."

A good example of this form of delirium is given by Dr. Abercrombie. "Many years ago," he says, "I saw a man who was seized with bleeding from the nose to such an extent that at last it became necessary to arrest it by pieces of sponge carried up from the fauces. Next day he was without complaint, except great weakness; on the third day he became highly maniacal; pulse generally from 90 to 100, and soft."

This form of delirium is not unfrequently preceded or followed by attacks of violent convulsions. I related a remarkable case of this kind in the Lumleian lectures of last year. The patient was a delicate woman who miscarried, with some hemorrhage; after this she became thin and pale. While in this state she experienced some giddiness of the head, as well as slight delirium, for which she was bled, and had leeches applied: owing to the giving way of the bandage on her arm, and the application of additional leeches to relieve the supposed congestion of the head, she lost still more blood: her convulsions recurred, and she became delirious and maniacal.

Cases of this kind will be more rare when a more general assent is given by members of the profession to the doctrine that congestion of the brain will not account for giddiness and delirium, and other signs of disturbed cerebral function.

Traumatic delirium.—A remarkable form of delirium has long been known to surgeons as apt to follow severe injuries, whether from accident or from surgical operation. Dupuytren has left a highly graphic description of this form of delirium, and gives it the name of *nervous* or *traumatic delirium.*

A man meets with a severe accident, a compound fracture, or he undergoes a great surgical operation: for a day or two matters seem to go on well, when he suddenly becomes confused in his ideas, incoherent, and at length he becomes wild and talkative, and wakeful: refuses food, tries to get out of bed, perhaps tears off his bandages or splint; and what is very remarkable, seems perfectly indifferent to pain, and moves the broken limb or injured part as if it were in a natural condition. Sleeplessness is a prominent feature of this delirium; and when that is overcome, as it frequently may be by the careful use of opium, the patient gets well; but sometimes the delirium is so violent as to exhaust the patient in a few days. Nor does the delirium always bear a direct proportion to the severity of the injury Dupuytren relates the case of a young man in whom it came on in consequence of a slight injury to one of his toes, and killed him in two days.

In these cases, as in the other examples of delirium which I have mentioned, post mortem inspection discloses no lesion of the brain or its membranes. "Neither in the cerebro-spinal apparatus, nor even in the other organs," says Dupuytren, "can we perceive any material lesion which can explain the disturbance which has taken place during life, which can afford a satisfactory explanation of the cause of death."

Delirium occurs in connection with typhus fever, with erysipelas, inflammation of internal organs, as the heart and lungs, and with the exanthemata.

Delirium of typhus.—The delirium of typhus is apt to come on in the second week: it varies in its characters from a low, muttering semicomatose condition to a highly excited maniacal state. Coming on in the course of a disease, which so terribly prostrates the powers of the patients, it must be regarded as a very formidable symptom, especially when it assumes the maniacal form: for, under the influence of this state of excitement, the patient is prompted to get out of bed, or otherwise to make great exertions, and thus exhaustion is produced, and not unfrequently a patient will die from sudden syncope caused by some effort he has made.

I have had many opportunities of examining the bodies of patients after the delirium of typhus; and in no instance have I been able to detect any lesion bearing upon the delirium. The brain in typhus is essentially healthy; but the condition of its blood-vessels corresponds with that of the blood-vessels everywhere else—namely, a state of laxity of their coats, while they contain, or appear to contain. more than their normal quantity of blood, and that of a dark venous kind; in some instances there is more or less subarachnoid fluid; in others the fluid is absent; never is there any sign of an active morbid process, like inflammation, either in the brain or its membranes, tending to generate new matter, as lymph and pus, and to destroy existing tissue.

This form of delirium is of much shorter duration than most of those which I have already described; nor has it any tendency to degenerate into a chronic state, as is the case with the hysterical and with the puerperal delirium. Like the traumatic delirium, it seldom lasts many days, either killing the patient by exhaustion, with more or less of coma, or ending in recovery.

Erysipelatous delirium.—The delirium of erysipelas resembles very closely that of typhus, excepting in this point, that it is perhaps more frequently of the more active and violent, than of the low and muttering kind. It commonly comes on with more or less of suddenness: you leave your patient going on well; on your next visit, a few hours ofterwards, you find him talkative, rambling, attempting to get out of bed, noisy, and soon he becomes so violent as to require the constant watchfulness of one or two attendants, or the restraint of the strait-waistcoat, to prevent him from injuring himself or others.

It occurs in both idiopathic and traumatic erysipelas; and is not confined to that of the head or neck, but will take place in cases in which the erysipelas is confined to the trunk, and never reaches the head. It seems more apt to occur in debilitated subjects—in patients after operations which have caused much loss of blood—and in the low and decidedly typhoid forms of erysipelas.

Patients die in it, just as in the delirium of typhus: they die suddenly in an effort, or they become much exhausted, or they fall into deep coma; but more frequently they recover, especially if care be taken to prevent them from making violent exertions, and to give them a proper amount of support. The duration of this delirium is not in general above a few days, and it very rarely degenerates into a chronic state.

The inspection of the brains in these cases shows no signs of active disease, nor any evidence, as might not unreasonably be supposed, of a state of brain similar to that of the external parts. The erysipelas does not fly from the exterior to the interior: there is no metastatis, although I should not be prepared to say that the brain is not affected by the poison of erysipelas. It is certain, however, from numerous post-mortem examinations, that the brain and its membranes, of patients dying under this form of delirium, exhibit no morbid alteration of any kind sufficient to account for the phenomena. What I have most frequently seen in this, as in other forms of delirium, has been a state of pallor of the grey matter, and an increased number of bloody points in the white matter of the hemispheres.

Rheumatic delirium.—The form of delirium which accompanies inflammation of the lung, or of the heart, occurs so commonly, if not uniformly, in the rheumatic state, that I shall describe it in connection with that delirium which arises in the course of rheumatic fever, under the name of *rheumatic delirium.*

The following description of this form of delirium accords with what I have myself seen, and what I find recorded by others:

A patient is seized with all the ordinary symptoms of rheumatic fever, and he goes on without any untoward symptoms,—it may be only for three or four days, it may be for a week, or even later,—when the nurse having perhaps reported that he passed a restless night or two, and wandered more or less, we find him delirious, raving, talking wildly, and, as in the traumatic delirium, entirely disregarding his hitherto exquisitely painful, and still swollen joints. The tendency in these cases is to the acute maniacal state, and to wakefulness; so that frequently the patient requires restraint and always the closest watchfulness.

As in the other acute forms of delirium, patients often die suddenly in this, evidently from exhaustion. Sometimes they quickly fall into a state of profound coma, which lasts from one to twenty-four hours, and terminates in the death of the patient. I suspect that removing patients from one place to another in rheumatic fever, is apt to bring on this mode of termination; for I have had several cases in which a patient was brought into the hospital late in the afternoon, having been three or four days ill of rheumatic fever, and in the course of the night he became delirious, and then comatose, and died.

This delirium is sometimes ushered in by other symptoms, which denote a more extensive disturbance of the nervous system than delirium would do. Thus, a patient will be seized with chorea-like jactitations affecting the upper extremities, and the muscles of the face; and sometimes a condition almost tetanic is present, and more or less of rigidity and opisthotonos are produced.

Coincident with the first appearance of these symptoms, that is, either of the delirium or the jactitations, we frequently find, but by no means always, the first signs of inflammation of the pericardium, or of the endocardium, or of one or both lungs, or of the pleura; and as the delirious state diverts the mind of the patient from the perception of all pain, it often happens that no other indications of the internal inflammation can be obtained than those of the physical signs, the rubbing sound, or the bellows-murmur, or the altered breathing sounds; and hence it has not unfrequently happened that in the midst of the great disturbance of the intellect, the inflammation within the thorax has been unsuspected and undetected.

Judging from my own observation of this delirium, I would lay it down that it occurs chiefly in those patients who exhibit considerable pallor, whether that pallor be simply the result of the rheumatic state, or of that combined with the effects of a greater or less loss of blood. I have seen it brought on in a patient, who had previously exhibited no untoward symptom, by the application of some leeches to a rheumatic joint, without any cardiac inflammation: and I have also seen it come on after very large bleedings, both general and topical, where there was no very extensive development of the rheumatic state, and where, also, the signs of cardiac inflammation were at most indicative of but a slight endocardial inflammation. But, on the other hand, nothing is more certain than that it has come on where there has been no bleeding practised at all: and that it has got well when bleeding, topical or general, has been practised *after* the appearance of the delirium.

The inexperienced practitioner is apt to mistake these cases for inflammation of the brain and its membranes, and to treat them accordingly.*

Med. Gaz., May 3, 1850, p. 745.

18.—ON THE TREATMENT OF TUBERCULAR MENINGITIS.—By Dr. Hahn.

The author first speaks of meningitis occurring suddenly, without being preceded by symptoms indicative of previous tuberculous diathesis. In these cases he advises bleeding and calomel, but relies chiefly on the latter, guarding at the same time against unnecessary salivation, the severity of which may destroy life after the disease for which the mercury was given has subsided. He speaks also in strong terms of the cold affusion, by which he states that he has several times succeeded in rousing the child after the supervention of complete coma. Another measure of great value in the same emergency, is friction of the scalp with tartar emetic ointment, repeated every two hours, until pustulation is established. This is a severe measure, and occasionally induces gangrene, but there are few parents who would not readily see their infant snatched from impending death, though at the risk of subsequent intense suffering. It is, however, possible by management, to avoid such successive inflammation. Of the success of this method the author speaks in high terms, having by it saved fourteen cases in apparently a hopeless state of coma.

In the second class of cases noticed in this memoir, viz., those in which the cerebral symptoms are preceded by others, denoting a general tubercular cachexia, a modified plan of treatment is advised, blood-letting, except locally and sparingly, is contraindicated; neither is it safe to push calomel to the same extent. The author in this, as in the preceding case, relies much on counter-irritation of the scalp, and advises the same means of fulfilling this indication.

The memoir terminates by the recital of several cases in which a cure was obtained by the tartar emetic friction of the scalp, under the most unpromising circumstances. Of these cases it will suffice to cite one.

A fine boy of nine months old, was suddenly attacked with convulsions. He recovered from these, and cut his first teeth shortly afterwards; he was soon observed to fall away, to become listless, and to lose his appetite, without any condition of tongue which could indicate intestinal derangement. His bowels became constipated, his pulse irregular, and he began to vomit and to become torpid. Fever was soon added to his symptoms, and it was evident that he was the subject of meningitis. Leeches were ap-

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[* Dr. Todd's further observations on this subject will be found among the "*Addenda*" at the end of this volume; the lectures containing them not being published in time to be printed in this place.]

plied, and calomel given, but in spite of treatment he lapsed into complete coma. As soon as the latter symptom become distinct, tartar emetic ointment was rubbed into the scalp every four hours over a space the size of a crown piece. Free suppuration ensued, and signs of amelioration were speedily witnessed. The child became gradually more sensible, his appetite returned, and in a fortnight all traces of his malady had vanished.

Prov. Med. and Surg. Jour., Nov. 28, 1849, p. 664.

19.—ON THE CEREBRAL DISEASES OF INFANCY.—By Dr. E. Copeman, Consulting Accoucheur to the Norwich Lying-in-Charity.

In taking a general view of what has been written on cerebral diseases, we shall be struck, not so much with a deficiency of knowledge as to their character, pathology, or symptoms, as with the indefinite and unsatisfactory methods of treating them. This defect is probably due to the excessive desire manifested to base principles of treatment upon *post-mortem* appearances; but, whilst the latter, although fully known and accurately described, vary so much in relation to the symptoms they are supposed to occasion, how can the former be depended upon for safely averting the great dangers we have to encounter? There is yet much—very much, to be learned in the treatment of these diseases. In what manner can such knowledge be most readily and perfectly obtained? The investigations hitherto made upon this subject, enable us to determine certain generalizations, and to state a few established facts, which afford useful hints for practical application.

1. Cerebral diseases occur most frequently in children of a scrofulous habit, or born of scrofulous parents. 2. Scrofula greatly modifies the character of cerebral as well as other diseases. 3. Cerebral diseases may exist independently of scrofula. 4. Headache, vomiting, constipation, and more or less pyrexia, are a combination of symptoms denoting, in children, serious, and often unmanageable cerebral disease. 5. A species of hydrocephalus, chiefly indicated by the preceding symptoms, is generally accompanied with, or depends upon, tubercular disease of the brain or its membranes. 6. There exists another species of hydrocephalus, attended with the usual symptoms of phrenitis, of a strictly inflammatory nature, and curable by strictly antiphlogistic remedies. 7. Hydrocephalus resulting from tubercular disease may assume an active inflammatory type, and be scarcely distinguishable from the last variety, except from its not being so amenable to antiphlogistic treatment. 8. Symptoms similar in many respects to those of acute hydrocephalus in one or other of the above forms, may arise from a system diametrically opposed to inflammation; these are curable only by a nourishing and mildly-stimulating plan of treatment. 9. Hydrocephalus, generally speaking, does not occur before the age of two years; and boys are more liable to it than girls. 10. Treatment, to be effectual, must be commenced at an early period of the disease. 11. The symptoms of cerebral diseases in children, and the *post-mortem* appearances, have not a definite or constant relation to each other; and the former are more to be depended upon than the latter for indications of treatment. 12. Constipation is not essential to the phrenitic variety of hydrocephalus. 13. Certain cases, accompanied with symptoms so constantly in connection with tubercular encephalitis as not to be distinguishable from the latter form of disease, admit of being cured; and may therefore be fairly considered as instances of the *curability* of a disease which is generally supposed to be incurable.

The treatment of diseases of children requires considerable tact and discrimination, both as to the nature of the remedies to be used, and the mode of employing them. We have tender bodies to deal with; their period of life greatly modifies the action of medicines; errors of judgment in prescribing are of more serious consequence, and life is altogether in greater jeopardy. It is often necessary to reduce arterial action, and *blood-letting* is sometimes attended with success, but in very young children this is a dangerous remedy, and probably not a few have fallen a sacrifice to its depressing influence. The usual method of drawing blood in children is to apply leeches, and children have bled to death from leech-bites. Cupping is an operation not easy to perform in children, but it is preferable to leeching, because by it the quantity of blood to be abstracted can be regulated, and the bleeding can be stopped as soon as enough blood has been removed. Blood-letting as a remedy, is fortunately seldom indispensable at the period of life in which children are most frequently affected by cerebral diseases, my own experience would almost say *never;* for in a period of more than fifteen years I have never myself drawn blood, either locally or generally (save by scarification of the gums or eyelids,) from a child under six years of age, for any complaint whatever. How then are inflammatory complaints to be treated? What are we to do in a case of phrenitic hydrocephalus, if we are not to bleed? Are we possessed of any other effectual means of combatting inflammation? Yes, we have many other rescources for lessening vascular action in children which will oftentimes enable us to spare a fluid so necessary to existence, and so often wanted in later periods of diseases, when it is difficult, if not impossible, to supply it. The *warm bath* is a powerful agent for relieving the circulation in infancy; *antimonial medicines* will reduce power to almost any necessary amount in children; *purgatives* also; but owing to the extreme susceptibility of the intestines of children to take on irritation with which the brain very quickly sympathises, it is not often advisable to use them freely; we may, however safely employ enemata, which have the effect of reducing the pulse and lessening heat of skin in a very satisfactory manner, as well as removing offending matter, and encouraging a flow of bile. But there is another class of medicines both safe and effectual for abating inflammatory affections in children, provided the stomach be not too irritable to retain them. I mean *diuretics*, and I have repeatedly observed, whether in fevers or inflammations, that promoting a copious flow of urine has, in a striking manner, produced an antiphlogistic effect. These measures may be employed also in combination, and when they are thus combined and judiciously applied, I have yet to learn that they are not capable of effecting as much for the removal of febrile action with scarcely the possibility of doing harm, as is usually effected by blood-letting. In the more advanced stages of inflammation, *calomel* for the removal of lymph, and *iodine* (liq. potassii iodidi comp.) for the absorption of effused fluid are well known and trustworthy remedies.

[Dr. Copeman remarks upon the difficulty there often is in distinguishing those cases which require stimulants from those which require an antiphlogistic plan of treatment, and recommends a minute attention to symptoms, as the only means by which this difficulty is to be overcome. He considers that the occurrence of febrile disturbance is generally a very good indication that simple remedies will not be sufficient, and that active treatment is required. After referring to the symptom in thoracic and abdominal affections, he says:—]

In head affections, unattended with fever, we ought not to resort hastily and actively to depletory measures, however much we may be inclined to suspect the existence of certain pathological conditions supposed to require antiphlogistic treatment. But there may be febrile excitement in a case where antiphlogistic treatment would be fatal. How are we then to judge. If the fever be of an intermitting character, leaving the patient feeble and depressed in the intervals, the pulse being unsteady and variable, it behoves us to be guarded in our employment of lowering remedial measures.

The following circumstances seem especially deserving of attentive consideration in the treatment of the diseases of infancy and childhood.

1. The delicate, perhaps only partially developed, structure of the vital

organs, the intolerance for the most part, of powerful medicines or doses, and the great restorative powers of nature at an early period of existence.

2. The necessity for adapting our remedial agents to the delicacy and susceptibility of the structures they are intended to influence, and fulfilling any given indications of treatment by the least possible violence or precipitancy, by the gentlest means.

3. Whilst entertaining a just idea of the nature and history of the disease we have to treat, we must at the same time observe particular symptoms minutely, and vary our plan of treatment according to the information which those symptoms are capable of affording.

4. The importance of endeavoring *to the very last* to preserve life, however desperate the circumstances may appear, keeping always in remembrance that "whilst there is life there is hope."—*Prov. Med. and Surg. Journal, Nov* 28, 1849, *p*. 650.

20.—ON THE RELATION BETWEEN EPILEPSY AND PUERPERAL CONVULSIONS.—By Dr. W. Tyler Smith.

At a late meeting of the Westminister Medical Society, Dr. Smith referred to the common opinion of the increased liability of epileptic persons to puerperal convulsions, founded, as he presumed, upon the resemblance between the two affections. Dr. S. remarked that there were considerable differences between the two, which he thus pointed out:

Epilepsy is generally a chronic—puerperal convulsion, an acute disease. Epilepsy commonly leads to idiocy; puerperal convulsions to mania. Asphyxia is more nearly reached in puerperal convulsions than in epilepsy.

Epilepsy is a disease of years; puerperal convulsion, a disease of hours or days. Epilepsy is connected with the ordinary functions of the body; puerperal attacks belong to an extraordinary function, of limited duration. In the one, consciousness is generally recovered between the fits; in the other, the continuance of coma from fit to fit is very common. The treatment required in the two diseases is very dissimilar. In epilepsy, there is generally the characteristic aura; in puerperal convulsions this is wanting. In puerperal convulsions, œdema of the extremities is as common, as it is rare in epilepsy. These circumstances must induce us to inquire whether puerperal convulsions ought not to be studied as a distinct and independent disease, as a variety of convulsion as far removed from epilepsy, as epilepsy was removed from the convulsions of infancy. But the important question, which could only be decided by experience, was—Were epileptics predisposed to puerperal convulsions? The author related four cases of epileptics becoming mothers, which had fallen under his own observation; in one, the first pregnancy and labour had been completed without any convulsions: in the second, two labours had been completed without puerperal convulsions, and the fits were rare during pregnancy; in the two remaining cases, the epilepsy had been very much relieved during the whole of the child-bearing epoch; and in one, ten pregnancies and labours had passed, without any convulsive seizure. These latter cases were now near the catamenial decline, and were affected with paroxysmal seizures of an epileptic character. Dr. Smith related the particulars of eleven other cases, which had been supplied to him by Dr. F. Churchill; Drs. Swayne and Herapath, of Bristol; Dr. R. Barnes; Mr. W. F. Barlow; Mr. Higginbottom; and Mr. R. U. West. The number of pregnancies in the fifteen cases amounted to about fifty-one. Puerperal convulsions of a decided character only occurred in two labours. In one case, there were three attacks of convulsions after the eleventh labour of an epileptic patient; and in another case, there was a single seizure the day after one of five labours. Generally the epileptic attacks were fewer, and, in several cases, disappeared altogether during gestation. Thus, the presence of epilepsy by no means appeared to be an active predisposing cause of puerperal convulsions; and, so far as the author's inquiries had extended, there was no tendency in puerperal convulsions to be followed by epilepsy, though it might be the case, when organic disease of the nervous centres, was induced by the puerperal attacks. Dr. Smith entered upon a consideration of the causes which led to the amelioration of epilepsy during gestation, referring it principally to the rest from the ovaria-uterine excitement of menstruation, in pregnancy. He dwelt on the frequency with which epilepsy was connected with the catamenial excitement, many cases occurring only at these periods, and others being aggravated at the monthly date. He also pointed out the infrequency of epilepsy, in purely amenorrhœal or chlorotic subjects, and referred to the fact that other disorders dependent upon ovario uterine excitement, as hysteria, and dysmenorrhœa, were relieved by pregnancy. As far as the cases now detailed went, it appeared that marriage was not so much to be dreaded in epileptic females as had been supposed, particularly where the fits were connected with catamenial excitement. It was clearly indicated that in epilepsy great attention should be given to soothe menstrual irritation, and that puerperal convulsions should be studied and treated without any special reference to epilepsy.

Dr. Robert Lee said that he had recently had under his care a lady who had been suffering from attacks of epilepsy every fortnight during the last eight or ten months, subsequent to the birth of her second child, when she had puerperal convulsions, and he was called to see her. This lady had never before been subject to epilepsy. Not having succeeded in stopping the fits, which at first occurred during the day, and latterly during the night, he had requested her husband to consult Dr. Marshall Hall, and to place her under his care. The fits still continued every fortnight. This case Dr. Lee said was the only one in which puerperal convulsions terminated in epilepsy, which had come under his observation during twenty-two years. Of the fifty-nine or sixty cases of puerperal convulsions which he had seen during that period, there were three in which epilepsy had previously existed in early life, and a considerably greater number where there had been hysteria. Dr. Lee was of opinion that chorea, hysteria, epilepsy, puerperal convulsions, and puerperal mania, were all different diseases, though closely allied to each other. He related a case of chorea in the sixth month of pregnancy, which occurred in St. George's Hospital in 1842, in which, after the expulsion of the contents of the uterus, the symptoms of chorea passed into fatal puerperal convulsions. The brain and spinal cord were both carefully examined, but no morbid appearance was discovered to account for the phenomena. On what condition of the brain and nervous system these diseases depended, he believed to be wholly unknown; and he considered it certain that they might all occur without any organic disease whatever. He had never supposed that epilepsy and puerperal convulsions were the same disease. On the contrary, he had always maintained, that though the symptoms observed during the fits were similar, they were different diseases. This was also the opinion of Dr. Burns, who states, in page 483 of his 'Principles of Midwifery,' that "puerperal convulsions are quite different from epilepsy." Some of the circumstances in which they differ have been pointed out by Dr. Burns, but in a less distinct manner than had been done by the author of the paper now read.—*Lancet, Dec.* 15, 1849, *p.* 644.

21.—ON THE USE OF BELLADONNA IN EPILEPSY, HYSTERIA, AND NEURALGIA.—By M. Debreyne.

Epilepsy.—M. Debreyne has found belladonna most useful in those cases of epilepsy, in which the attacks occur frequently, and even daily. In young subjects, it is not rare to find them affected with worms at the same time; and M. Debreyne even supposes that this coincidence is constant, the worms being either a cause or a complication of the epileptic convulsions. Hence, he combines vermifuge medicines with belladonna, with the effect of generally producing a rapid alleviation of the symptoms. In epilepsy, the dose for the first day should be ten centigrammes (1½ grains) of aqueous extract of belladonna; five centigrammes morning and evening: on the second and third days, five centigrammes, morning, noon, and evening; and on the remaining days, ten centigrammes are to be taken morning and evening. M. Debreyne refers to patients who have thus taken sixty-five centigrammes (10 grains) of the extract, in twenty-four hours, without experiencing the least inconvenience. In all cases, the use of the remedy must be continued for some time. An epileptic patient, aged 48 years, took twenty centigrammes of extract of belladonna daily, during *twenty months*, with the effect only of diminishing the duration of the attacks: the treatment was persisted in, and they gradually became less frequent, and at last completely ceased. In a little girl, aged eight years, the attacks began to become less frequent on the fourth day of the treatment; and at the end of a month, the patient was cured. As a precautionary measure, however, she continued to take five centigrammes of extract of belladonna daily, during two months.

Hysteria.—This affection receives marked benefit from belladonna. The following is M. Debreyne's formula: camphor, twelve grammes; assafœtida, twelve grammes; extract of belladonna, four grammes: aqueous extract of opium, one gramme; syrup of gum, a sufficient quantity to make 120 pills. One pill to be given the first day, two on the second, and the dose is to be gradually increased to six pills in twenty-four hours.

Neuralgia.—M. Debreyne relates several cases of the successful employment of belladonna in this affection. One patient had suffered during seven or eight years from very severe neuralgic pains in all parts of the head. All the usual remedies had been tried without effect; a pommade of belladonna was applied, which produced marked relief on the first day, and cured the patient in a month. Another case was one in which daily paroxysms of frontal neuralgia had obstinately continued for eleven years. The belladonna pommade was applied: the pain suddenly ceased, and had not re-appeared two months after the employment of the remedy. The pommade which M. Debreyne uses is highly charged with the active principle. It consists of extract of belladonna, lard, of each twelve grammes; opium, two grammes; to be mixed accurately. It is rubbed over the seat of pain, especially during the exacerbations, or three times a day. On each occasion, a piece of the size of a hazel-nut is to be rubbed in for five or six minutes, until it is perfectly absorbed: this may be furthered by adding a little saliva from time to time.—*London Journal*, *April*, 1850, *p*. 386.

22.—TREATMENT OF NEURALGIA AND RHEUMATISM BY COLD DOUCHES AND SWEATING.

At Bellevue, near Paris, there is a fine establishment, in which everything of practical value connected with "the water-cure"—be it hot or cold—is applied to the treatment of various obstinate affections. The advantages obtained from a rational employment of several powerful agents, as distinguished from the empirical use of one alone, are very great. They were pointed out in an excellent Memoir which M. Fleury presented at the last meeting of the Academy of Science. The author selected forty-six cases, observed at the establishment during the last four years, and from their results deduced the following conclusions:—

Five patients, labouring under attacks of acute neuralgia from four to fifteen days, (facial, intercostal, sciatic,) were cured by one to three applications of the cold douche, both general and local, employed after the use of the dry stove, which had produced copious transpiration. Here the revulsive action of heat followed by cold was much more energetic than that of flying blisters or the cautery.

Eleven patients, attacked by acute muscular rheumatism, fixed in its seat and very severe, were rapidly cured in the same manner.

In *four* cases of obstinate neuralgia, which had resisted every known method of treatment from four to ten years, a cure was obtained by cold douches (general and local,) sometimes preceded by the use of the hot air bath. The duration of the treatment varied from one to six months, and its average was three months. *Three* patients, who for five to fifteen years had presented, in the most marked degree, that *ensemble* of symptoms known under the title of "nervous accidents," and who had been reduced by them to the lowest state, in spite of medical art, were cured in the same manner. Here, however, the treatment was continued from seven to eighteen months, and the average duration was more than a year.

Finally, in twenty-three cases of chronic muscular rheumatism, which had resisted every species of treatment, and the most celebrated mineral waters of Europe, the cold douches after sweating effected complete cures. The average time of treatment was four months; the minimum one month; the maximum seven.

Here, it must be confessed, we have a rational method of treatment, applied according to the rules of art, and as successful as the miracles of hydropathy.—*Med. Times, Feb.* 2, 1850, *p.* 77.

23.—ON THE TREATMENT OF NEURALGIA ACCOMPANYING HERPES ZOSTER.—By E. Humpage, Esq., Bristol, Dr. S. Palmer, Newbury, and P. Marriott, Esq., Aberystwith.

[For the distressing and intractable neuralgic pain which often (or, as some say, *always*,) accompanies herpes zoster, Mr. Humpage gives the following advice:]

One of the best remedies in this very troublesome disoder, is, the application of a blister, *near* or *over* the painful part: immediately it is healed, let there be applied a piece of belladonna plaster on leather. The neuralgia is always relieved, and generally removed: the stimulus of the vesication, followed by the sedative influence of the belladonna, appearing to exhaust the morbid influence, (or whatever else we like to call it,) on which the pain depends, and healthy function following, the patient is cured. Of course in all such cases we must attend to the general health: but I do not believe that all the tonics of the Pharmacopœia would ever cure a local neuralgia, *excited apparently* by the morbid secretion of a previous disease.

[Dr. Palmer says that his cases]

Principally occurred in elderly persons; and after using a variety of medicines, I found that this distressing *sequela* yielded most readily to grain doses of the oxide of silver, combined with the compound galbanum pill and extract of hyoscyamus, I likewise employed, as an external application, the tincture of arnica montana, with the tincture of soap and opium, and as the results in all were most satisfactory, I feel justified in recommending this mode of treatment.

[Mr. Marriott who states that he has seen a large number of cases of this affection, believes that there are no means of curing it. He says that the pains subside spontaneously, and that the period of their duration is in proportion to the age of the patient; varying from six or eight weeks, at the age of fourteen or sixteen, to two years or more at the age of seventy and upwards.]—*Prov. Med. and Surg. Journal, Dec.* 26, 1849, *p.* 718.

24.—CASES OF NEURALGIA DEPENDING ON DISORDER OF THE DIGESTIVE ORGANS.—By Dr. James Stark.

[The first case occurred in a lady of forty years old, to whom Dr. Stark was called on the 7th May, 1849. This lady had had the disease for fifteen years, during which she had been subjected to various kinds of treatment, but without any decided relief. The original cause of the attack was supposed to be exposure to cold when the body was overheated in dancing. Dr. Stark says :—]

I learned that the fits of neuralgia were always most severe in spring, and that for several years past they became at that time so agonizing and so protracted as quite to unfit her for the duties of life. That day, and for some months previous to my seeing her, the paroxysms of neuralgia had commenced about eight in the morning, by a creeping and thrilling sensation over the left side of the head, concentrating about the *supra-orbitar foramen*, and extending inwards and backwards towards the base of the eye and brain. The pain rapidly increased in intensity, till it became insufferable, as if the head were squeezed in a vice of burning iron, and she got quite deranged. In this state she lay, tossing in restless extasy, till about two o'clock in the afternoon, when the pain began to abate, and by three o'clock had in general left her weakened, prostrated in mind and body, and unfit for anything. During the summer and autumnal months, the neuralgic fits were in general of shorter duration, rarely exceeding half an hour in continuance, and not so severe, but were more liable to return on excitement, or after meals.

The tongue had a smooth, swollen or œdematous, glassy aspect, with a thin viscid white coating, through which the papillæ projected with a flattened button like appearance. The breath had a peculiar heavy odour. The skin was soft, clammy, very loose, as if wanting both in elasticity and in tonicity. The complexion was pasty. The bowels reported irregular, but generally costive, often five days passing without a motion, at other times slight diarrhœa for a-day or two. The catamenia were stated to be regular, but watery and rather profuse. The pulse was 60, languid, and very compressible. There was no appetite. She suffered from flatulence after meals, and had faulty digestion.

As the *primæ viæ* appeared in this case to be chiefly at fault, and the disease presented a decided periodic tendency, there seemed reasonable grounds for holding our prospects of relief, to a certain extent at least. She was, therefore, ordered to take two grains of bebeerine at six o'clock evening, a laxative of a particular kind at bed-time, and other two grains of bebeerine at seven o'clock morning daily till relief was experienced. The laxative consisted of jalap fifteen grains, magnesia and carbonate of soda, of each twelve grains, and calomel half a grain.

After two days, viz., on the 9th of May, I repeated my visit at eleven o'clock morning, and found her so much relieved, that, instead of lying in bed insensible, or deranged with the pain, she was dressed, and was sitting up. The pain, though severe, and confined to the branches of the *supra-orbitar nerve*, was bearable, and she thought from the sensation that it was beginning to abate for the day. The laxative had operated powerfully, bringing away a large quantity of hardened scybalæ of a disgusting odour. She and her attendants mentioned that, since the first laxative operated, the pain had not been so severe as to deprive her of her senses, and even the first day was diminished in duration about three hours. She was directed to continue the medicines for at least a-week regularly, then only take the laxative every other night, and the pills of bebeerine in the morning only. By the 20th May, the neuralgic pains had entirely left her, and for several mornings previous had been so trifling as to give no great annoyance. The tongue was now clean, and more healthy looking. The complexion was clear, and had lost almost entirely its pasty look. The appetite was good, the digestive powers had improved, and she suffered little from flatulence. The laxative was therefore diminished by one-half, and directed to be taken every third night, one grain of bebeerine being continued every morning for a week longer. After this the bebeerine was stopped, and a laxative of magnesia taken occasionally so as to regulate the bowels. By following these directions, and having recourse to her old laxative whenever the pain threatened to return in consequence of exposure to cold, she has escaped all protracted suffering up to this date, 22nd February, 1850, and finds the disease quite manageable.

[The other patient was an elderly unmarried lady, without teeth, who was seized with the pain whilst eating oysters. It was supposed that the gum had been wounded by a fragment of oyster-shell, but no such wound could be detected. After three years, during which the patient suffered severely without applying for any medical aid, Dr. Stark was sent for. He tells us:]

When called to see her on the 3rd of February, 1849, I found her suffering acute agony from a pain which seized her suddenly and without warning, in the gum of the left lower jaw, at a point corresponding to the position of the last molar tooth. The pain was compared to a red-hot knife piercing the jaw; it continued with great intensity for about three minutes, then wore off, striking forwards to the chin, and backwards to the ear. The paroxysms were always excited by eating, and were most severe and frequent for about two hours after taking food.

Taking wine or brandy greatly aggravated the severity and increased the frequency of the paroxysms. After a meal, pressure on the gum, or speaking, were almost sure to induce the neuralgia; but after this the gum could in general be freely handled without inducing the pain. The gum was quite healthy in appearance, smooth, neither injected nor swollon more than the healthy side, and firm over the jaw-bone; without the slightest appearance of cicatrix or any prominence to indicate the lodgment of a foreign body within it. The tongue was coated with a thin whitish viscid-looking fur; the breath had a heavy acid odour; and the bowls were habitually very costive, sometimes not moving for five and even eight days. The appetite was bad, the pulse languid and slow, as might be expected in an old person; the sleep troubled, and disturbed with dreams.

This case also appeared to be one where the disease originated in, and was dependent on, disordered function of the digestive organs. It had suddenly attacked her when eating an acid meal of raw oysters; it was aggravated by the articles of diet received into the stomach, and notably so both in severity and frequency by those drinks (wine and brandy) which, in an unhealthy stomach, more speedly run to acidity. She was therefore directed to take daily, at bedtime, a gentle laxative of magnesia, carbonate of soda, and chalk with mercury powder, and morning and afternoon two grains of sulphate of quinine. Within a week, the neuralgic pain had almost completely left her, not seizing her oftner than twice or thrice daily, and then only lasting for a moment. The quinine was therefore stopped, and Henry's calcined magnesia substituted for the laxative; the neuralgic affection from day to day wore away, and for the last nine months she has had no recurrence of it.

These two cases were selected from several others, as clear instances of the close connexion between *tic dolouretux* and disordered state of the functions of the alimentary canal. I am quite aware that some late writers on this subject have positively asserted that they have never seen one case of neuralgia referrible to such an origin; but, in cases of this kind, facts are of much greater importance than opinions; and the above cases appear to demonstrate so clearly that such a connexion does exist, that I feel inclined on the other hand to assert, that, in the great majority of cases which occur, the *fons et origo mali*, lies with the digestive organs. If a severe and undoubted case of neuralgia, of fifteen years' standing,—one, too, deemed incurable by several practitioners,—be absolutely cured by restoring the functions of the digestiv organs,—again attacks, or threatens to attack, whenever the bowels are neglected, and is again and instantly removed by the use of laxatives of a particular kind, indpendent altogether of antiperiodics,—I leave the profession to draw the conclusion as to the cause and origin of the disease. I have never yet seen a case of *tic douloureux* (not depending on organic disease) in which the digestives organs were not more or less disordered ; and since I adopted this view of the disease, and treated it accordingly, I have not yet met with one case which proved rebellious to treatment. Indeed I am not quite sure that the antiperiodics (quinine, bebeerine, and iron) in common use in this disease, when they do aid in removing it, do so more by virtue of their action in improving the tone of the stomach and bowels, than throuhg their antiperiodic properity.

Only three days ago (20th February,) when looking over my notes of these cases, I was suddenly called to see the most striking instance I have yet witnessed of the close connection between neuralgia aud disorder of the digestives organs. A young boy, of about five and a-half years of age, had just finished his dinner, when he suddenly screamed out and threw himself on the ground in the greatest agony. His screams were frightful to hear, and he appeared quite distracted, and on the point of going into convulsions, from pain referred to the back molar tooth of the lower jaw, which tooth appeared perfectly sound. I learned that for some time past, he had been much troubled with indigestion, acidity of the stomach, and irregularity of the bowels, and that many articles of food, such as beef, potatoes, vegetables, or wine, beer, and tea, caused great uneasiness, feverishness, with restlessness, and starting during sleep. He had that day, however, seemed better than usual, and at his urgent request had barley vegetable broth, boiled beef and a suet dumpling.

Coming fresh from the perusal of the above cases, it appeared to me quite clear, that I had to deal with a case of neuralgia (call it acute tooth-ache if you will,) dependent on a disordered state of the digestive organs, more immediately excited by and overloaded stomach, probably accompanied by acidity. A sulphate of zinc emetic was therefore immediately administered, which cleared the stomach of a large quantity of soup of a strong acid odour, and all he had eated for dinner. As soon as the vomiting was over, he was caused to swallow a does consisting of chalk, magnesia, carbonate of soda, and cinnamon powder. He had not swallowed it two minutes when the neuralgic pain ceased, and has not since returned.

These cases, then, should have the effect of inducing the profession to direct their attention more to the connection between functional disorder of the digestive organs and nerualgic affections, as I feel persuaded from my own experience that the more the subject is attended to the closer will the connection be found to be. Rheumatic must not, however, be confounded with neuralgic affections, of every false conclusions may be arrived at, as the pathology and treatment of these so far kindred affections are entirely different.—*Edin. Med. and Surg. Journal*, *April*, 1850, *p*. 390.

25.—OBSERVATIONS ON THE EFFECT OF ELECTRICAL CURRENTS ON THE NERVES, AND THEIR THERAPEUTICAL APPLICATION.

BY M. MATTEUCCI, Professor in the Unversity of Pisa.

[The following remarks are taken from Matteucci's lectures 'On the Physical Phenomena of Living Beings,' translated by Dr. Pereira. The conclusion aimed at by M. Matteucci respecting the force of the contraction excited by the electric current in different cases, are these :]

1. The contraction excited by the electric current, transmitted along a nerve in the direction of its ramification, and which we call *direct*, is always more energetic than that which this same current produces when passing along the nerve in the opposite direction.

2. The direct current weakens and rapidly destroys the excitability of a nerve ; whilst the passage of the inverse current augments it within certain limits.

3. To produce these effects, the action on the nerve, of the direct as well as of the inverse current, ought to be continued for a certain time, which will be longer in proportion as the excitability of the nerve is weaker.

It is very easy to prove, by experiment, the most important of these conclusions; that is to say, that when the direct current traverses the lumbar nerve of a frog for twenty or thirty minutes, there are no further contractions, either when interrupting or closing the circuit; on the contrary, the contraction obtained by opening the circuit of the inverse current, after many hours' passage, scarcely differs from that which occurred at first, when the nerve was endowed with great excitability. This difference in the excitability of a nerve, according as it has been submitted to the passage of a direct or inverse current, can be observed whatever may have been the manner in which the nerve is stimulated. When we operate with the inverse current on a very excitable nerve, and one which has never before been submitted to the passage of the current, it is impossible to discover any difference between the contraction excited by the opening of the circuit of this current after the passage has continued for one second, and that which occurs after the passage has been continued for ten or twenty seconds. It does, however, exist; but to appreciate it, it is necessary to proceed more rapidly. If the passage of the inverse current be limited to a small fraction of a second, we find, on opening the circuit, a weaker contraction than that which is obtained after the current has circulated for one or more seconds. It is very easy to prove this, by closing the circuit by the aid of a wheel furnished with a metallic tooth, and to which we attach one of the wires of the pile during its rotation. When the nerve has lost a part of its excitability, we then readily perceive that the contraction manifested on opening the circuit increases proportionally to the time that the circuit has been closed. The greatest effect of the passage is obtained at the end of fifteen or twenty seconds. It is needless to say, that these effects do not continue to increase on a dead animal.

Peculiarities of Electric Irritation of the Nerves—I consider it necessary to give here a summary of the principal differences which have been ascertained experimentally, between the effects produced by electric irritation of the nerves, and those determined by other stimulating agents, such as heat, chemical and mechanical actions, &c. The following are these different distinctions:—

1. Electricity is the only irritant which can excite, at one time sensation, and at another contraction, according to the direction in which it traverses a nerve.
2. The electric current alone, in passing transversely across a nerve, produces no phenomena due to the excitability of a nerve.
3. The electric current has no effect on the nerves, that is, it neither causes contraction nor sensation, when its action on the nerve is prolonged.
4. The electric current alone can modify the excitability of a nerve, and even rapidly destroy it, when the current circulates in a certain direction, and can preserve or augment the excitability, when passing in the opposite direction.
5. Lastly, of all irritating agents, the electric current is the only one which possesses, for a long space of time, the power of reviving the excitability of the nerve, when it has become very much enfeebled in respect to other stimulants.

[The following remarks are made on the]

Therapeutical Use of the Current.—I cannot conclude this lecture without stating some of the therapeutical applications made of the electric current, and founded upon the scientific principles, which I have made known to you.

In Paralysis.—Abstraction being made of all purely theoretical ideas, and independently of all hypothesis of the nervous force, we may admit that, in certain cases of paralysis, the nerves undergo an alteration analogous to that which they would suffer if they had been subjected to a continued passage of the electric current. We have seen that, in order to restore to a nerve the excitability lost by the passage of this current, it is necessaay to subject it to the action of the inverse current.

I must add, in favour of the efficacy of the therapeutic use of this current, that a limb, although paralysed constantly suffers some contractions when it is submitted, either to the passage of a current or to the action of the electric discharges; and these contractions favour the restoration of the functions of the muscles. Experiment confirms these ideas; divide the two sciatic nerves of a living frog, allow one of the limbs to remain quiet for ten, fifteen, or twenty days, and submit the other, two or three times a day, to the action of the current. The latter will continue to contract, whilst the other will fail to give any contractions when the current is applied to it.

I am anxious to state to you some rules which I consider as important in the application of a current to the treatment of paralysis. You should always commence by employing a very weak current. This precaution seems to me now more important than I formerly believed it to be, having seen one paralytic patient seized with true tetanic convulsions under the action of a current furnished by a single element. Take care never to continue the current for too long a period, especially if it be energetic. Appl y the interrupted current in preference to the continued one; but after *twenty* or *thirty* shocks, at the most allow the patient to have a few moments repose. Both practice and theory seem to prove, that the interrupted current is more useful than the continued one.

A pile, with Mason's wheel, or still better, the electro-magnetic machine is the most convenient apparatus for this purpose. Electro-magnetic apparatus are now constructed, in which the interruptions of the current are made without the necessity of an assistant.

We may employ, as conductors, two ribands of sheet lead or copper. The extremities, which are placed in contact with the skin, should be covered with cloth moistened with salt and water. In some cases, it is useful to employ, as extremities of the conductors, acupuncture needles.

The number of authentic cases of paralysis cured by the electrical treatment, is already sufficiently great to encourage physicians and patients to persevere in its use. Perseverance indeed is indispensable in the application of the electric current, for without it, successful results are impossible.

In Tetanus.—The use of the electric current has been suggested in another malady, namely, tetanus. I believe I am the first who has attempted its application to man.

The principles on which is founded its employment for the cure of this disease are the following. A current which circulates by jerks in an animal during a certain time, produces tetanic convulsions; the direct current, if continued sufficiently long, produces, on the contrary, paralysis. From this it was concluded, that the continued passage of the latter, in a tetanised limb would destroy this condition, by producing a state more or less allied to paralysis. The truth of this conclusion is demonstrated by facts. In operating upon frogs which have been tetanised by narcotics or hydrocyanic acid, we observe a fit of tetanus cease under the influence of the prolonged passage of a direct current. The frogs die without presenting those convulsions, which are observed to take place when these animals have not been submitted to the direct current.

The effects produced by the application of the electric current in a case of tetanus, which I published in the 'Bibliothèque Universelle' appeared to me in some degree to prove the truth of the scientific principles which I have explained to you. During the passage of the current, the patient experienced no violent convulsions; he was able to open and shut his mouth; and circulation and respiration appeared to be re-established. Unfortunately, this amendment did not continue long; the disease being occasioned, and kept up by the introduction of foreign bodies into the muscles of the leg. Perhaps more satisfactory results from the electric current may be expected, in cases where tetanus has not been caused by a traumatic injury. More-ever, we ought already to be thankful in being able to lessen the sufferings to which this dreadful disease gives rise.

[We may add to this, that Matteucci quite negatives the idea of the possibility of the solution of *cataracts* or of *calculi* by means of galvanism.]—*Edin. Med. and Surg. Journal, Jan.* 1850, *p.* 201.

26.—ON THE MEDICAL EMPLOYMENT OF ELECTRICITY IN PARALYTIC AND OTHER DISEASES.—By Dr. TERZI.

The Italian *scienziati* and *medichi* have, from the period of Galvani and Volta to the present time, devoted much attention to the investigation of the agency exerted upon the animal frame by electricity, both in a physiological and therapeutical point of view. Dr. Terzi, in the first portion of his paper, furnishes an account of the results which have been derived from the labors of Puccinotti, Fario, Berrutti, Botto, Bellingeri, Malinverni, the illustrious Matteucci, and many others who have written upon the subject since the observation made upon it by Müller, in his physiology, rendered a reconsideration of it requisite. For this, however, we have no space, and must content ourselves with a brief notice of the author's own contribution.

His mode of employing electricity varies with the object he has in view, and to an axtent, perhaps, that may be considered somewhat fanciful. When he wishes to produce a chemical or chemico-dynamic, rather than a dynamic action, he employs Volta's, Wollaston's, or Daniell's pile: and the more intimately he desires to effect the chemical organism, the smaller is the pile, and the fewer elements does it consist of, so that a very feeble current is induced. This mode, he says, is further advantageous by enabling us to introduce into the economy certain medicinal substances appropriate to the nature of the case, by suspending them in, and uniting them with, the conducting fluid employed. When he wishes to produce an almost exclusively dynamic action, he prefers the cylindrical machine, or Leyden phial.

In cases of sensorial paralysis, in which the skin has lost its tactile sensibility, he brings the conductors into immediate contact with it, and directs the currents from the lower to the superior parts, this being the direction in which the sensorial impressions operate. In those of motor paralysis, he carries the currents into the substance of the muscles, by transfixing these with fine steel needles, which are then brought into inter-communication with each other, and with the conductors, by means of a delicate wire, and the current directed from above downwards. In order, sometimes, to produce a temporary perturbatory effect, the direction of the currents is reversed. One advantage of this electro-acupuncture is the facility it affords of especially operating upon certain muscles, instead of upon the fleshy mass at random. Thus accordingly as the flexors or extensors may have become inert, the needles are passed into either, and movements of flexion or extension induced. These movements can be maintained during a brief period, the muscles undergoing an almost tetanic contraction, and palpitating as it were under the electric influence. When the continuous current is furnished by a very small number of elements, and directed to the extensor muscles of a limb, whose flexors are powerfully contracted, this contraction temporarily disappears, the limb remaining very flexible in all directions.

Dr. Terzi relates several cases in detail, in some of which a complete cure, in others amelioration, was procured. We may mention the chief particulars of some of these. The first was a case of *paraplegia, with atrophy of the muscles of the legs, and anchylosis of the tibio-tarsal articulations*, and occurred in the person of a girl, æt. 19, who had been first seized about six months before with difficulty of deglutition; the whole of the voluntary muscles after a while became paralysed; and notwithstanding active antiphlogistic, revulsive, and antispasmodic treatment, little amendment ensued. At the commencement, some *engorgement* of the medulla was supposed to exist; but however this might have been, when the author was desired to undertake electrical treatment of the case, he regarded it to have assumed the intensity and conditions of a primary neurosis, in obedience to his physiological views, which lead him to believe that the nerves participate in the possession or generation of that power, at all events under certain circumstances, of which they are usually merely the conductors. This induced him to encourage the patient by a sanguine prognosis.

He considered the indications of treatment to be threefold. (1.) To obviate by frictions, and well-regulated gymnastic movements, the atrophy, as far as it depended upon inaction and impaired circulation. (2.) To stimulate separately the activity of the spinal marrow, and of the nerves of the lower extremities, by a gentle current or slight shocks. This was effected as regards the medulla by passing a long needle between two of the vertebræ of the upper part of the spine, and another between two of the lower, and bringing them into inter-communication with each other and the pile, connecting the positive pole with the upper needle. For the limbs, a greater number of needles were passed into the substance of the muscles. (3).—To bring the respective parts into a unison of action, by directing shocks rather than a current from the spine towards the limbs, previously connected by needles. He commenced with a very feeble action, produced by a few pairs of plates, adding to the conducting fluid strong infusion of arnica and valerian; and as he desired an increase of activity, augmenting the number of plates, and adding vinegar to the infusions, until he reached fifty pairs of large plates. When the electricity was employed in the form of a gentle current, the sittings lasted forty minutes, but when shocks were arrived at, only thirty minutes; and at every sixth or seventh day, a day or two of rest was allowed. It is a painful procedure; but the girl, full of courage, bore it well, and was rewarded by a perfect cure. The steps are too long to detail; but we may state that, after forty days, the treatment was suspended (though great improvement had been achieved,) on account of the coldness of the season, to be resumed again in the summer; when, after twenty-five other applications, the cure became complete.

The *second* case was one of very recent *hemiplegia*, occurring in a man æt 35, a subject of pellagra. He was treated for a supposed hyperæmia of the cerebro-spinal axis without benefit, and then submitted to Wollaston's pile for about a month, which sufficed for his complete restoration. This case confirmed Prof. Mariannini's view of the great efficacy of electro-acupuncture as a means of acting on the *morale* of the patient; for the man, previously in deep despondency, now conceived the highest hopes of cure, which doubtless co-operated in its production. The third case was one of *facial paralysis*, coming on in a man (æt. 30,) given to venery, and preceded by disturbance in the head. After antiphlogistics and derivatives had been tried in vain, the conductor from the positive pole was brought in contact with the skin, sometimes at the angle of the jaw, and sometimes at the external meatus; that attached to the negative pole, sharpened into a fine point, being carried in the direction of the paralysed muscles. Slight but frequent shocks were thus transmitted, during half an hour, for fifteen days, soon after which all traces of the disease disappeared.

A case is detailed to show the efficacy of electricity in *constipation from intestinal paresis*. It occurred in the person of a lad (æt. 11,) who also suffered from glossoplegia, and a paralysis of nearly all the voluntary muscles of the trunk and limbs. Defæcation was sometimes involuntary, and at others only producible by violent drastics. In spite of the best treatment, the paralysis had been stationary for some years. When the author saw him, he had not had a stool for fifteen days, and all purgatives were vomited and glysters returned. With the view of exciting the suspended peristaltic movements, the conductor from the positive pole of a pile was brought in contact with the tongue, and that from the negative, previously covered with a thin piece of cloth, carried into the rectum. The patient could not tolerate the sensation in the rectum until the pairs of plates had been reduced to eight, when a current was passed in for twenty minutes. Very obvious movements were induced in the abdomen, and were followed by pains, but no stools. Repeating the galvanism next day, very severe pains were excited in ten minutes; and by the aid of a glyster, an abundant discharge of fæces procured.

Besides the above, he relates four cases of *hemiplegia, with glossoplegia*, in which great amelioration was produced, but not a cure, in consequence, apparently, of an insufficiently long perseverance on the part of the patient. In two other cases of *hemiplegia*, no amelioration resulted. In both, the paralysis followed severe attacks of apoplexy; and the author's experience agrees with that of others, in demonstrating that, when the brain has been seriously and primarily compromised, and the use of electricity long delayed, the progressive improvement and complete cure obtainable in other cases is never to be expected.

A case of *bronchocele* was likewise successfully treated by electro-acupuncture. The number of plates employed amounted to from sixteen to twenty, and upon the intervening discs of cloth, moistened in an acid or saline solution, a little *tinct. of iodine* was dropped. The tumour at first became painful, and increased in size, but soon after diminished. In two cases of *nervous amaurosis*, he tried the effects of continuous currents, as recommended by Prof. Finella, but with no conclusive results. *Bulletino delle Scienzi Mediche.—British and Foreign Medico-Chirurg. Review, April* 1850, *p.* 558.

27.—CASE OF HYSTERICAL PARALYSIS TREATED BY ELECTICITY.—By —— BALMAN, Esq., Liverpool.

[Mr. Balman's patient, a young lady 16 years of age, had been treated for three years for curvature of the spine. At first it appears to have been lateral, but subsequently angular curvature came on. In the summer of 1849, Mr. Balman first saw her, and thus describes the case:]

On entering her room I found her sitting on a sofa, looking pale, but otherwise presenting no striking indication of ill health; her attendant said she had been unable to stand, walk, or speak, since the fit of the previous day. On examination, I found the spine very crooked, with an angular curvature of the two last dorsal vertebræ: on passing my fingers down the median line there appeared to be distinct tenderness both between the scapulæ and over and around the seat of the projecting spine, extending down to the sacrum; the feet were cold, livid, and completely insensible to the prick of a needle, as far as the knees; the hands were in a similar condition, but the loss of sensation did not extend beyond the wrists.

Although unable to stand or support the body for a moment without assistance, I soon afterwards learnt she was enabled to turn the feet about in almost any direction when lying down in bed; her nights were restless and without sleep, and the eyes presented that peculiar glistening aspect so characteristic of hysteria. She complained of headache, and cramps over the whole body: these were rendered very distressing by cold and pressure of every kind; even a very powerful liniment served but to renew the cramps and destroy all sense of feeling on being applied to any part of the body. I very soon had an opportunity of seeing her in one of the paroxsyms, which now generally occurred about once in twenty-four hours: these, as in similar cases of this mysterious disease, were truly frightful to witness; the legs extended, and rigid as marble, hands clenched and immovable, the head and neck thrown back, whilst the whole body appeared to be convulsed and writhing under the most violent tetanic spasms. Sometimes the symptoms for a time assumed a different character, and she would lie motionless in one position for hours together, in a state more resembling catalepsy than anything else.

The catamenia did not appear more than once from May 1847 to May

1848; from this day she continued to menstruate regularly every three weeks, always more profusely than usual. Leucorrhœa, which so frequently precedes and accompanies these cases, set in about Christmas, 1848, and continued gradually to increase up to the time of the first paroxysm of hysteria: this appeared a not very unimportant symptom, as tending to throw some light as to the exciting cause of the disease: it is at all events evident that the severity of this complication corresponded very closely with the gradual deterioration in her health about this time: and on inquiring more particularly into this matter, I find that she suffered so much inconvenience from this cause as to oblige her for some time before the attack to discontinue her usual morning exercise; and latterly even a few turns in the garden caused so much exhaustion that she very frequently fainted after coming in.

I commenced the treatment with the usual routine of antispasmodid and tonic medicines, such as ammonia, iron, fœtid gums, &c., without much apparent benefit: opium was administered at night to soothe the irritability of the nervous system and induce sleep, but without success; three grains of solid opium given at bed-time served only to make her still more restless, without any narcotic effect being produced whatever.

Sept. 6th.—After one month's trial of these and a variety of other remedies, finding matters but little improved, the pain in the lower part of the back being constant, and the severity of which I was inclined to think contributed in a great measure to renew the fits, whilst the paralysis, if it may be so called, remained stationary, I began to think that there must be some irritation of the spinal cord or its membranes. I now, therefore, applied seven or eight cupping-glasses along the whole of the spine every alternate day; prescribed small doses of the hyd. c. creta and carb. of soda every night, and a turpentine enema every third morning: on one occasion I ventured to apply the scarificator, and took away about three ounces of blood, with evident relief. Under this mode of treatment she began steadily to improve: headache much relieved, and the pain and tenderness of the back not so urgent; she also soon passed better nights, sleeping three or four hours together soundly: the attacks returned on two or three occasions afterwards, always just before the approach of the catamenia. The lower extremities, however continued useless, and without any return of sensibility, and she had as usual to be carried by her attendant from room to room. I now commenced to apply galvanism, with a view of restoring the use of her limbs; at first the shock of a very powerful battery was not felt on placing one pole to the sacrum and the opposite one to any part of the leg below the knee, but after a few trials I found one isolated spot, about the circumference of a shilling, over the outer part of the tibia, a few inches below the knee, sensitive to its effects. Continuing its use every day the feeling seemed to radiate day by day downwards, over the whole of the external part of the leg to the ankle; the inner part of the leg remaining as before completely unaffected by the electric current; the sensibility, however, soon returned here likewise, and extended gradually to the extremity of the second toe: immediately after the next séance I learnt with satisfaction that soon after my leaving the room, my patient got up very coolly and walked across the room, and indeed over the whole house, unattended or supported by any one. This happened on the 12th October, since which she has continued to take regular walks out of doors for considerable distances, and is rapidly improving in all other respects.

Remarks.—My first impression on seeing this case was that it was nothing more than hysteria, and the loss of power over the lower limbs was simply one of those protean forms which this disease sometimes assumes. This opinion was in some measure strengthened by the fact that she had, a little time prior to my being requested to see her, suddenly lost all power of her limbs, and as suddenly regained their use. That the paralysis was not due to caries of the vertebræ, or any serious organic lesion of the cord, appeared to me evident, from the entire absence of any constitutional symptoms to indicate such a state of things; for the body was plump and well nourished; the limbs, although useless, were firm and resisting: and she was enabled, as I have said, to turn them about almost in any direction when lying down. Moreover, there was a perverted or morbid state of sensibility of the cutaneous surface of the entire body, (which, I should suppose, would not be the result of any local injury of the cord,) so much so, that pressure and friction of any kind appeared to extinguish at once all sense of feeling. Even a strong liniment had precisely the same effect.

Not succeeding, however, with the usual routine of remedies in producing much improvement in my patient's health, but in some respects losing ground, the numbness and loss of sensibility of the limbs increasing, whilst the pain in the back was in no way diminished, I was led to believe that that there must be some functional derangement of the spinal cord or its appendages, arising from some cause or other, and that the symptoms resembled, in many material points, the somewhat obscure, but not less interesting class of cases described by the Messrs. Griffin, Teale, Burns, and others, under the head of Spinal Irritation. My conclusions were drawn, as they sometimes must be in studying the diversified and often complex phenomena exhibited in this particular class of diseases, from watching the effects of the remedial means and appliances employed. Our treatment of many of these cases must, therefore, to some extent, be empirical, until morbid anatomy is found to reconcile more closely the relation of many of the anomalous symptoms presented in this disease with some precise pathological lesion after death.

As regards the actual seat of the disease, it in all probability was connected with some congested state of the spinial veins; and indeed, it does not seem very difficult to imagine why this state of things should occur if we carefully examine the anatomical arrangement and structure of the venous system of the spinal cord. Thus, according to Breschet, there is everything here calculated to favour stagnation of blood. 1. The veins are deprived of valves, thinner, and much more delicate than in any other part of the body. 2. They are relatively very numerous, subdivided and tortuous; so that each spinal nerve may be said to be literally encircled and bathed in venous blood, as they penetrate in the intervertebral foramina. The consequence of this arrangement, notwithstanding the frequent communications by which this impediment is in some degree obviated, must be that the blood will move more slowly and with greater difficulty. That congestion does sometimes happen from this peculiar disposition of the veins of the spinal axis, must, therefore, be extremely probable. Ollivier mentions that he had often found in his dissections fibrinous clots blocking up and distending the veins of the spinal cord, and even those which accompany its nerves; and many other instances are related by Morgagni.

The influence of galvanism in restoring the power of locomotion was certainly more remarkable than anything I have before witnessed. That this was in reality the result of the galvanic stimulus, and not, as we know is sometimes the case, by some sudden moral impression unloosing the magic web, which seems to hold captive the power of volition,—I think there cannot be the least doubt. The effect of this agent was perceptible at each application; and it was not until the remedy had been persevered with for some time that the beneficial results were manifested so strikingly.

To show how powerful is the operation of electricity in stimulating directly the voluntary muscles, I may add that she felt, as she often expressed, a strong inclination to walk after each séance; so much so, that she many times made the attempt, but always without success, falling thump upon the floor, until the period mentioned; and even then when she had regained the power of standing in the erect attitude, it required much determination to keep it; and but for the exercise of a series of Terpsichorian movements, she feels convinced that she would not have been able to have retained her position.

I may mention that I made trial of this remedy at a much earlier period in this case without observing any benefit; on the contrary, many of the symptoms appeared to be aggravated after its use. It was, therefore, at a particular stage of the disease, when counter-irritant and alterative medicines had removed the more active symptoms of the complaint, that galvanism appeared to do good. This remedy, therefore, like any other, is applicable only under certain conditions; and the success of it will depend not only upon the tact and acumen of the practitioner in the selection of his cases, but also the particular phase of the disease at which its use is apparently indicated.

It was the *secondary* current of electricity which was employed throughout; an important fact in its bearing upon the statements lately put forth upon the value of the primary current only, and the inutility of the secondary.—*Med. Gazette, Jan.* 25, 1850, *p.* 157.

28.—A CASE OF HYSTERICAL PARALYSIS.—By W. Thorn, Esq., London.

Mrs. W., a married woman, aged forty-three, having three children, the eldest twenty-one, the youngest about ten, a waistcoat maker by trade, of a leucophlegmatic appearance, and highly nervous temperament, and subject to occasional fits of hysteria, globus hystericus very troublesome, summoned me to attend her on the 2d of June, 1848. I found her in a state approaching collapse, breathing extremely difficult, almost amounting to asthma, and which she supposed was brought about by the sudden news of the death of her sister, aged forty-eight, from phthisis. She was in a few days recovered from this state by opium, aperients, sinapisms, and a blister dressed with savine ointment, and the menses returned on the 23d, without anything particular to remark.

I ascertained, that for the last twenty years she had suffered from prolapsus uteri, appearing externally, unless supported by a broad ring pessary, which she had worn for about seven years; as it did not afford efficient support, I advised the substitution of sponge, which answered much better, and was withal more cleanly; there was some leucorrhœal discharge, which materially diminished when the sponge was introduced, soaked in a mild astringent solution. There was no ulceration of the neck of the uterus.

On the 29th of September, 1848, Mrs. W. experienced her first attack of paralysis, which came on without notice, and lasted three weeks; all the limbs were paralysed, as also the bladder, and there was a great determination of blood to the brain. This attack was got under by the application of a few leeches behind each ear, and a relay on the temples, blisters the whole length of the spine, and pills containing the twelfth of a grain of strychnine every three hours. On recovering from this attack, a seton was inserted in the back of the neck, in the hope of preventing another; the futility of which was evidenced by the second paralytic attack, on the 28th of November following, which, lasting fourteen days, was extinguished by the application of leeches to the lumbar region of the spine; blisters and pills as before. The general health was now particularly attended to, iron and quinine was given, and the appearance of the patient much improved, but the third attack came on, December 19th, lasting about nine days; it was removed by blisters and pills as before; the electric shock, and a strengthening plaster to the spine.

Mrs. W. was now free from an attack until January 27th, in 1849, when complete aphonia came on, (after severe globus hystericus,) which lasted three weeks, but was at length removed by stimulating gargles, application of tincture of iodine to the throat externally, and a blister to the nape of the neck. Shortly after this a violent attack of headache, with considerable determination of blood also, was removed by leeches once more behind the ears.

The menses never ceased, but were indeed quite regular to the day; occasionally there were pains of a bearing-down kind, which were only relieved by large doses of opium, followed by aperients.

Mrs. W. continued tolerably well from January (having gone to the country the latter part of the summer, for a week or two only) down to October 24th, when she was again paralysed for eight days. Blisters and pills as before; the left arm and hand, having remained two days longer motionless this time than the other limbs, was recovered by another blister between the shoulders.

There was this month (November) another slight attack, of six days' duration, which yielded to the same treatment, and Mrs. W. remains at this writing convalescent, taking, however, tincture of muriate of iron, and a pill to regulate the bowels, which are generally constipated, more, perhaps, from a sluggish disposition than from any defect in the biliary secretion. I had forgotten to mention that the bladder was paralysed in every attack, and of course the catheter had to be used. Suspecting at first that these attacks of paralysis arose from that peculiar hysterical temperament which gives rise to so many Protean forms of disease, I gave as purgatives generally turpentine and castor oil, and in one attack I thought the power of the bladder and limbs seemed to return earlier in consequence, but in the last two attacks these remedies seemed of no serviee, and the blisters had to be repeated to produce a beneficial effect. I must also state, that in the last attack a mild epileptiform convulsion came on, and the tongue was slightly bitten, no one being at hand to prevent the mischief.

Lancet, Dec. 22, 1850, p. 660.

29.—A CASE OF IDIOPATHIC TETANUS TREATED BY GALVANISM.—By H. HAILEY, Esq., Newport Pagnell.

[In this case the patient was a boy twelve years old, in whom the exciting cause of the attack appeared to be the prolonged use of a cold bath, after walking rapidly, on a very hot day. On the 14th of July, three days after the attack, when Mr. Hailey saw him, the symptoms were extremely well-marked, and the patient's sufferings very severe. He was treated by the exhibition of active cathartics, large doses of opium, sinapisms to the spine, stimula enemata, &c., and the administration of brandy and beef-tea was not omitted; but up to the 17th without any improvement. Upon this day, Mr. Hailey tells us :—]

I administered several rather strong shocks from an electro-galvanic apparatus; first along the spine, then over the masseter muscles, and then in the course of the great sciatic nerves. This appeared to cause great pain through the whole system, and at first brought on the convulsions much stronger. The opium was discontinued altogether. In the course of a few hours he appeared more calm, took a mixture of beef-tea and brandy, and the bowels not being acted upon in the evening, I prescribed another enema of caster oil and turpentine.

18th. Has passed a better night. Convulsions less frequent. Has passed more urine. Bowels relieved. The galvanism was again administered; and, in giving a shock in the course of the great sciatic nerve, he moved the right leg, and afterwards said he could for the first time feel it. A short time after its administration to day, to the surprise of his friends, he got up in bed and asked for something to eat, but, before it could be procured, he fell back as rigid as heretofore. I ordered the abdomen and legs to be again well rubbed, a blister over each masseter muscle, and on each side of his spine over the region of the cervical plexus.

19th. Has slept better. Convulsions less frequent. Has taken more nourishment. Pulse small, feeble, 120. Bowels relieved. The blisters having risen, I applied galvanism over each masseter muscle, and over the blisters on the spinal column; ordered the blisters to be kept open, and brandy, gruel, beef-tea, or port wine to be administered when an opportunity occurred, and a blister to be applied over the loins.

20th. Has passed a better night, the paroxysms having occurred only twice during that period. Can open his mouth wider, and has eaten a small piece of pudding. Bowels constipated. Galvanism to be applied over the same parts as yesterday, and, in addition, on the blisters in the lumbar region.

21st Has passed a good night, not having had more than two convulsive fits since yesterday morning. Can raise his legs, and slightly move his back; can open his mouth wider. Bowels constipated, and still very hard. Has masticated a little chicken. Ordered him ol. ricini, ℥ss. to be taken directly, and quin. sulph. gr. ij. to be put upon the tongue every four hours, and the galvanism to be applied over the same parts as yesterday.

22d. Continues improving. To continue the same treatment as yesterday.

23d. Much better. The bowels have acted spontaneously. Has slept well, and had but one convulsive fit in the course of the night. Can masticate his food. Ordered him out of bed for two hours, and to continue medicine and galvanism as before.

25th. Much better. Can stand on his legs with a very little support. Continue medicine and galvanism.

27th. Much better. Bowels softer. Pulse between 80 and 90, and stronger. Bowels continue to act without the aid of medicine. Ordered him to continue the galvanism, and to take a tonic mixture of sulphate of iron and quinine.

30th. Has been out for a ride. Appetite very good. Can masticate his food well. Has had no convulsive fits for the last two days. Pulse 80, and strong.

August 7th. Is able to walk about as usual, with the exception of complaining of great weakness of the legs and soreness of the feet. Has discontinued all medicine.

From this time he daily improved, having no return of the convulsions, and, by September 1st, was able to follow his usual avocations.

The chief interest in this case consists in the support which it affords to the humoral view of the pathology of tetanus put forward by Dr. Todd in the Lumleian Lectures, published in the Medical Gazette last year, and in the influence of galvanism in reducing the tonic convulsions. As in many other cases of idiopathic tetanus, the disease seemed to originate in exposure to cold, and a check to the perspiration,—causes very favorable to the depravation of the blood. The great exertions which the patient made in walking would, no doubt, largely contribute to determine the influence of any morbid matter accumulating in his blood, upon the muscular and nervous systems.

The application of galvanism,—a mode of treatment suggested some years ago by professor Matteucci, of Pisa,—seemed to have a very beneficial influence. It was administered on the seventh day of the attack, when the disease was quite at its height: immediately after its application, the symptoms began to abate, and the rigidity of the muscles and the convulsive attacks diminished steadily each succeeding day; and it is worthy of notice, that simultaneously with the application of galvanism all opiate medicines were discontinued.—*Med. Gazette, Feb.* 22, 1850, *p.* 324.

30.—CASE OF TRAUMATIC TETANUS, UNSUCCESSFULLY TREATED BY CHLOROFORM. Under the care of SAMUEL SOLLY, Esq., Surgeon to St. Thomas's Hospital.

[This patient was a bricklayer, 50 years of age, whose left hand was severely crushed by a fall of bricks. Notwithstanding the accident, he continued at his work for a few days, until gangrene occurred, involving the fingers up to the second phalanx. He then applied at the hospital, and the fingers (except one which had suffered less than the others) were amputated. In a clinical lecture on the case, Mr. Solly said:]

A very good lesson might be learned from the manner in which the present patient's hand was dressed when he was admitted. Straps had been rather tightly applied, aided by some turns of a roller. Now, in such cases, (the man had refused amputation,) it is far wiser to dress the part very lightly, and to give it support, as the effects of pressure in such lacerations must of course increase the tendency to disorganization and sloughing. In idiopathic gangrene, the line of demarcation should always be waited for, and nature be allowed to limit the work of destruction; but in traumatic cases such a delay is of course unnecessary. That the gangrene must partly be attributed, in this case, to the patient continuing his work for five or six days after the accident is obvious; for it is a well-known fact that the muscular system of one arm sympathizes with that of the other; and no good results can be obtained, if both be not kept at rest. In the removal of fingers, it should be a rule to save the heads of the metacarpal bones, with working men; for the breadth, and a certain amount of the strength of the hand, are preserved; whilst with persons who do not obtain their livelihood by manual labour, the metacarpal head should be removed, so that the lateral compression may give the hand a better appearance.—Twenty-four hours after the operation, the patient complained of slight pain in the throat. This was soon followed by difficulty of swallowing, and stiffness about the jaw. Mr. Solly immediately ordered a blister down the whole length of the spine, a sinapism to the throat, a tobacco enema, and a poultice to the wound. The next day risus sardonicus appeared, the jaw was stiffer, pain in the back set in, and the existence of tetanus could no longer be doubted. Another tobacco enema and calomel and opium were now administered. Soon, however, there was complete opisthotonos, the mouth could not be opened; pulse 140; diaphragmatic breathing, and intercostal muscles in a state of complete spasm. Chloroform was now applied to the surface denuded by the blister; it caused much burning, but considerably diminished the pain in the back; it had no effect on the rigidity of the jaws, but lessened the risus sardonicus. The chloroform was subsequently applied by the same method over the pterygoid muscles, this likewise gave some relief; but it was thought advisable not to continue the anæsthetic, as a whole pint had already been used, by means of which, however, some sleep had been obtained. Mr. Butler, of Woolwich, was lately more fortunate; he succeeded in completely subduing tetanic symptoms in a boy who had run a splinter under his nail, by making him inhale the chloroform for a little while. The results, however, were less happy at St. Bartholomew's and the London Hospitals in similar trials. On consultation it was now decided that the arm should not be removed. Opisthotonos became soon very severe, and the dysphagia permanent, with pulse 136; at this time the finger, which had been spared, was removed, and muriate of morphia applied endermically. This narcotic produced deep sleep, and the patient fell into a comatose state, during which Mr. Dixon opened the jugular vein to relieve the head, though the coma was not looked upon by the medical officers, and in particular by Dr. Bennet, as being connected with the morphia. Death, however, occurred, preceded by slight spasm, thirty hours after the first sympoms of tetanus, the patient having become quite sensible for a short time previous to his decease.

From this case it may be gathered, that pain in the throat is a very early symptom of the tetanic affection. And as its remedial means, we should state, that in this hospital two cases of tetanus recently recovered by the use of tobacco enemata and calomel and opium; and one great point to be kept in view is, to keep up the patient, as far as possible, by the use of tonics. No particular alterations were found on a post-mortem examination, except softening of the anterior columns of the cord in the lumbar region. Mr. Solly is inclined to believe that this softening takes place before death, but that it is connected with tetanus, not as a cause, but as an effect; the latter being produced by over action of the nervous and muscular systems; and this conjecture is strengthened by the same appearance having been presented in a case of death by overdoses of strychnine, which lately came under Mr. Solly's notice. This gentleman likewise thinks, that by the aid of the microscope, and close observation, some pathological alteration in fatal cases of tetanus will at last be discovered.—*Lancet, Dec.* 1, 1849, *p.* 584.

31.—CASE OF TRUAMATIC TETANUS CURED BY ETHER INHALATION.—

By G. H. Smith, Esq., Pinang, China.

[In this case the symptoms were severe, but of a chronic character, having commenced twelve days before Mr. Smith saw the patient, who was a Chinese. They were ascribed to a wound with a fish-bone received seven days previous.] Mr. S. says:—

The case appearing one favourable to testing the anti-spasmodic powers of chloroform, a teaspoonful and a half of that fluid (prepared according to Dumas' formula, specific gravity 1490), poured on a handkerchief, was applied to the mouth and nostrils. In a very short time it took effect, and exhibited its influence over the disease in reducing the tension of the muscles of the lower extremities; at the end of two minutes its full operation was produced; there was a complete insensibility to pain, a needle thrust into the flesh causing no indication of that—indeed, the patient expressed himself all the while as "feeling very easy;" the muscles of the face and neck were partially relaxed, the head could be turned a little from side to side, the jaws separated for a short way, and all the extremities moved with freedom. When the patient was raised, he maintianed the sitting posture, but the spine still persevered its stiff and bent appearance. The pulse was but little affected.

The relaxation thus produced gradually subsided, and in two hours the tetanic symptoms had all returned as strong as ever. The chloroform was repeated with like effects and results.

I now determined on trusting to this agent, but at the same time to endeavour to bring the system under the influence of mercury, and also to use any other auxiliary means likely to afford relief, and promote cure. Having only a small quantity of chloroform, ether was substituted for it.

Five drachms of rectified ether, poured into a large bladder, mounted with a common bone pipe, introduced into the mouth through the space left open by the dislodged incisors, were inhaled morning and evening. Ten grains of calomel were administered twice a day; the body was immersed in warm water, to cleanse it of the impurities with which it had been smeared; and one drachm of mercurial ointment was rubbed in daily, over the groins and armpits. The bowels, which were very obstinate, were occasionally opened by three or four drops of croton oil, or by a draught composed of infusion of senna, tincture of jalap, and extract of elaterium; and a belladonna plaster was applied along the spine. Morphine draughts were given for the first few nights, but discontinued, as they failed to produce sleep.

In a very few days there was evident improvement. The tension and rigidity of the muscles of the extremities first gave way; then of those of the neck and face, the power to open the jaws slowly, but gradually, increasing; and next of those of the back, which last, however, continued somewhat stiff and painful for a considerable number of days after the disease had disappeared from other parts; and it was also remarked that the right (the wounded) side remained weaker, and longer liable to twitchings, than the left side. The cure progressed almost uninterruptedly, though the patient fell off rapidly in flesh; and on the 12th of May his pulse became so perceptibly weaker, that he was allowed a glass of sherry and a basin of soup, daily, under which he, in a few days, began to gather strength.

He was very soon got under the influence of the mercury; on the 11th of May, his mouth being affected, the calomel and ointment were discontinued. At the commencement of the treatment, five drachms of ether were required to produce a full effect; but as the symptoms declined, a less quantity, or four drachms, was found sufficient; and the last dose, only three drachms (June 15th inst.), produced such a powerful effect, causing so great a degree of stupor and prostration, as to create some alarm. The inhalation was supposed carried far enough, when the respiration became short and hurried, the eyes staring, and the arms dropped by the side. From the 4th to the 22nd of May the inhalation was repeated twice a day: from the 22nd to the 28th, once daily; and from the last date to the 15th of June, twice a week; when it was altogether discontinued. After every exhibition, the patient expressed immediate relief. On the 14th of the month he was able to rise without assistance; on the 18th he could walk a short way, with the help of a stick; and on the 23rd he was able to move out of doors. After this date he gained strength rapidly, and now (the 18th of June) is quite recovered. The ether was persevered in so long, on account of the slight pain and stiffness experienced in the loins, and the twitches felt during progression in the tendo-Achillis of right side.

The patient became exceedingly fond of the medicine; the taste for it seemed to grow upon him; he watched for the hours of its administration with impatience; he inhaled the vapour with great vigour—especially towards the last; and sometimes it required considerable force to withdraw the pipe. It was truly ridiculous to witness the craving he at times evinced for it: he would open and shut the mouth, with a forward motion, as if attempting to follow and seize the pipe; and frequently solicited a repitition of the dose in the most pressing manner.

It was very curious to observe the different effects of the ether on this man at different periods of his cure. At first the whole power of the medicine seemed expended in reducing the muscular tension, insensibility to pain and some degree of stupor being the only additional symptoms; but as the disease gave way, the effects produced on the mind increased, whilst those on the body became less marked. The artificial disease produced, if it may be so termed, was marked by three distinct stages—first, extreme nervous and muscular prostration; second, reaction, with more or less mental excitement and delusion; and third, a slighter degree of prostration or a feeling of fatigue and desire for repose.

In the first stage there was flushing of the face and a peculiar expression of countenance, between that of moroseness and vacancy, followed, in a few moments, by a death-like paralysis of the whole frame, which comprised this stage, and continued for a minute or two.

As the second advanced, the patient sat himself up erect, looking wildly about, and then, either remained quiet, keeping his eyes steadfastly fixed on some point or other, or, as was the case more frequently, commenced moving his body about in a variety of ways. Sometimes he would swing his head and body round and round with great rapidity, and the explanation given for such a feat was, that he supposed himself suspended in the air: at others he would stoop down and execute movements with his hands, (not unlike those of a dog scraping at a rat-hole), calling out the while "Allah zullah ada zakan,"—which, in English, means, "God is pressing him down;" and he often also, during this stage, expressed great alarm, and, among other strange fancies, supposed "the world was at an end," and "that he saw his father, mother, and other friends," who had long since been dead.

He was suspicious of strangers, and very impatient of their presence, sometimes abusing them in no measured terms, and on such occasions displayed no contemptible knowledge of the various languages spoken in the East,—Siamese, Chinese, Malay, Kling, Hindostanee, &c.; but his friends he never forgot, and would cry and caress them on any attempt being made to deceive him in respect of them. It was very remarkable, that if roused and if his attention was forcibly recalled to some previous subject, especially one in which he had much personal interest, he would converse to the point, and very rationally too. The singular features presented by this case, I confess myself quite unable to expound; the case, however, exhibited many other peculiarities, but I have related enough, and perhaps more than will be credited.

The langour and prostration which succeed and form the third stage usually induce the patient to seek relief in an hour's repose.

In conclusion I would remark, that Attong is a very quiet, industrious man, and a very intelligent one of his class. He does not smoke, and never was an opium smoker.—*Lancet, Dec.* 22, 1849, *p.* 667.

32.—CASE OF TRAUMATIC TETANUS TREATED BY STRONG VOLUNTARY ACTION OF THE RESPIRATORY MUSCLES.—By M. CRUVEILHIER.

[The following case is from Cruveilhier's work on Pathological Anatomy.] As physiological pathology has taught us that death takes place in tetanus, when the spasm attacks the muscles which preside over respiration, deglutition, and phonation, one is tempted to inquire whether it would not be possible to substitute for the convulsive contraction, a voluntary, permanent and energetic action of these muscles. Such was the thought which directed me to the following case.

[The case was one of a peasant who labored under tetanus produced by the forcible separation of the thumb from the hand.]

The patient was young, and full of life and courage, and I ventured to assure him of being cured if he submitted to my orders. I placed myself before him, and instructed him to respire in a measured time, making as deep inspirations as possible. To direct him in this fatiguing exercise I beat before him the measure *a deux temps.* During an hour there was an attack of suffocation or strangulation. My place was taken by assistants, who relieved each other, and at the end of four hours the patient fell into a profound sleep. On his waking, the same system was recommenced, which was again followed by sleep. After the suspension of this treatment, there were slight exacerbations, but they speedily gave way, and he was completely cured.—*Dublin Quart. Journal, Feb.* 1850, *p.* 172.

33.—TREATMENT OF CHOREA BY PRUSSIATE OF IRON.

M. FAIVRE D'ESNANS mentions in the Journal de Medecine et de Chirurgie Pratiques, that he has abtained the happiest results from the prussiate of iron in chorea and epilepsy, and he gives several cases where the cure was obtained in between four and eight days. He uses the following formula: Prussiate of iron, fifteen grs., extract of valerian, forty-five grains; make twenty-four pills. One pill to be taken three times a day, at six hours interval, each pill to be followed by a wine-glass of infusion of valerian. The author was induced to try the prussiate of iron from having seen M. Jourdes use it at the military hospital of Strasburg, for intermittent fever. As he considers that both diseases (chorea and ague) have their seat in the medulla spinalis, he thought that the same remedies would prove efficacious in both complaints, in which supposition, according to his statements, he was not deceived.—*Lancet, April* 6, 1850, *p.* 413.

34.—FUNCTIONS OF THE PNEUMOGASTRIC NERVE.—By M. Longet.

The following is M. Longet's summary:

1. From its origin, as far as the superior jugular ganglion, the pneumogastric is exclusively a nerve of sensation.

2. The stimulation of its proper fibres, at their extremities, has especially the effect of inducing the reflex movements of deglutition, chymification, circulation, and respiration. At the same time, it would be a serious error to suppose that, if the excitor influence of these fibres were cut off, the reflex motor actions would necessarily be abolished.

3. Below the superior jugular ganglion, the trunk of the pneumogastric represents a mixed nerve, exercising a motor influence, voluntary on some organs, involuntary on others. The voluntary power it owes to its *direct* motor fibres; the involuntary to the *indirect* before enumerated.

4. The sources of innervation required to maintain the function of an organ are multiplied in proportion to its physiological importance. Thus the organic movements of the lungs, heart, and stomach, are influenced by motor fibres coming from numerous points of the nervous system. It is the same with the movements of deglutition, and with the respiratory dilation of the glottis.

5. The anastomotic branch of the spinal accessory, which, to the exclusion of every other nerve, presides over the vocal movements of the larynx, only represents a *partial motor root* of the pneumogastric.

6. It is neither correct nor rational to conclude that, because, in the absence of this anastomotic branch, the phenomena of respiration, circulation, and digestion, continue in animals, the pneumogastric nerve must be mixed at its origin. The internal branch of the spinal accessory is only one of the scources through which the trunk of the pneumogastric receives motor filaments from the cerebro-spinal centre.—*London Journal, Feb.* 1850, *p.* 185.

DISEASES OF THE ORGANS OF CIRCULATION.

35.—COMPOSITION OF THE BLOOD.—By Dr. H. Bence Jones, F. R. S., Physician to St. George's Hospital.

[The object of Dr. Jones in the following remarks is, to show the relation of the blood "to the food, to the body, and to the urine."]

The blood, like all vegetable or animal food, consists of water, nitrogenized substances, non-nitrogenized substances, and salts, which, when burnt, give ashes.

Any single analysis of the blood is of no value quantitatively. It serves well, however, to show what kind of substances enter into its composition. There is not, nor, indeed, can there be, any standard analysis of blood, to which all others may be referred. The blood has been called an internal atmosphere, and in its constant momentary variations, in its unceasing change, it may well be compared to the atmosphere. Each moment its composition, as a whole, is changing. Each respiration produces its change on the blood. Each time food is taken, a great change in the blood must occur. You cannot add a pound or two of matter to the blood without changing it. Each action of a muscle, or nutrition of any part of the body, must take something from the blood, and thus change its composition. So, also, each excretion from the blood must effect its peculiar changes on that blood, out of which each excretion is taken. These are the broad outlines of the causes of the changes of the blood. The water is always changing. The nitrogenized and un-nitrogenized substances are always varying in amount; even the salts, even the alkalescence of the blood, is in a perpetual state of variation; at no two moments of the day is it the same.—The quantity, then, of the various substances present in the blood is constantly changing, and the variations in the state of health require to be far more minutely studied than they have been, before the deductions as to the variations in disease can be safely trusted.

We have in the blood, albumen, fibrin, blood-globules—all albuminous substances; fat, a non-nitrogenous organic substance; salts; and water.

The albumen, fat, ashes, and water, are the same that existed in the food. The fibrin and the blood-globules are the constituents of the blood, which do not exist in the food. It is the production of these by the blood out of the food to which the term assimilation must chiefly be applied. The chemistry of this assimilation—that is, the chemistry of the formation of fibrin and blood-globules—is at present almost entirely unknown to us, and therefore it is well called a vital process, and belongs as yet to physiology, and not to chemistry.

In disease, the constituents of the blood undergo various and great alterations in their amount; sometimes some constituent is found to be much increased, at other times much diminished. Tables illustrating these changes you will find in Andral's work on the blood. For the purpose of making the effect of disease very evident, I have chosen out from that work the following analysis, which presents the most striking variations, and you will see therefrom how an analysis of the blood might assist your diagnosis in a difficult case.

BLOOD.	Health.	Variation in Disease.	Rheumatism.	Fever.	Anæmia.	Cerebral Congestion.	Bright's Disease.
Fibrin	3	10½ to 1	10	.9	3.5	2.7	3.2
Globules	127	185 to 21	101	93.1	38.5	152.3	82.
Solids of serum .	80	114 to 57	90	86.0	89.	105.	64.8
Water	800	915 to 725	799	820.	869.	740.	850.
	1000		1000	1000	1000	1000	1000

In this table the contrast in the amount of fibrin, between the blood in fever and rheumatism is very marked. It shows well also, how high the fibrin is both in anæmia and in Bright's disease; and hence the liability to acute or subacute inflammations in these diseases. In both, although the amount of blood-globules is greatly diminished, the fibrin is increased. In Bright's disease the decrease of the albumen of the serum is very evident also.

It has lately been shown, by Dr. Garrod, that in gouty patients, urate of soda is contained in the serum of the blood. This although long suspected, from the occurrence of deposits of this salt round and in the joints of some patients, had never been proved to the satisfaction of the chemist. The method I use for obtaining the demonstration of uric acid in the blood is by no means difficult. I have here the blood drawn from two patients in the hospital. The clear serum is poured into a basin, and evaporated at 212° to perfect dryness. The mass is to be reduced to the finest possible powder, and then treated at the temperature of 100° F., with distilled water for an hour; by this means every thing soluble in the the residuum, is obtained in solution, and the urate of soda being soluble is dissolved out.

The solution is then to be evaporated to a very small bulk, and strong acetic acid should be added. Acetate of soda is thus formed, and uric acid is set free; and in the course of a few, or many hours, according to the quantity of uric acid and the dilution of the mother liquor, the uric acid crystallizes out, as you see it here, on the sides or bottom of the tube. To the eye, the crystals look like small grains of Cayenne pepper; through the microscope they look like some uric acid crystals from the urine; and if a few of them are taken, treated thus, with nitric acid in the usual way, the diagnostic pink reaction is obtained.

Dr. Garrod has very lately detected in the blood a substance which crystallizes in microscopic octahedral crystals. He considers this to be oxalate of lime. But this, and all other statements founded on microscopic chemistry alone, must be received with great caution. (Med. Chir. Trans. 1849.)

Lastly, in the blood of the ox, a substance resembling hippuric acid, in crystalline form and chemical reactions, has just been discovered. (Comptes Rendus, Dec. 24th, 1849.)—*Lancet, Jan.* 26, 1850, *p.* 103.

36.—ON THE EXACT POSITION OF THE ORIFICES OF THE HEART, AND THE GREAT VESSELS.—By Dr. O'B. Bellingham, Physician to St. Vincent's Hospital, Dublin.

Relative Position of the Orifices of the Heart to the Parietes of the Chest.—The right auriculo-ventricular orifice lies behind the centre of the sternum, on a line with the lower margin of the articulation of the cartilages of the fourth ribs with the sternum.

The left auriculo-ventricular orifice lies behind the cartilage of the fourth left rib, near the sternum.

The pulmonary valves are on a line with the space between the cartilages of the second and third ribs, to the left of the sternum, and very close to this bone. In some instances they lie a little lower down,—viz. on a line with the junction of the cartilage of the third left rib with the sternum, and immediately under it.

The aortic valves lie behind the sternum, on a line with the junction of the cartilages of the third ribs with the sternum, and towards the left edge of this bone. When the valves of the pulmonary artery are situated lower down, the semilunar valves of the aorta will be lower also, and on a line with the interval between the insertion of the cartilages of the third and fourth ribs.

The free edge of the semilunar valves of the aorta corresponds accurately, M. Gendrin observes, to the base of the pulmonary valves. A line drawn across the inferior margin of the third ribs corresponds to the base of the valves of the pulmonary artery, and to the free border of the aortic valves.

Relative Position of the Orifices of the Heart to one another.—The right ventricle ascends higher than the left, and the left ventricle descends lower than the right. Hence the origin of the pulmonary artery is on a plane above that of the aorta.

The pulmonary orifice is the highest up, as well as the most anterior, of all the orifices of the heart. The aortic orifice lies behind it, and on a plane lower down. The left auriculo-ventricular orifice is immediately behind the aortic orifice, but on a plane lower down. The right auriculo-ventricular orifice is nearly on the same plane as the left. but more anterior.

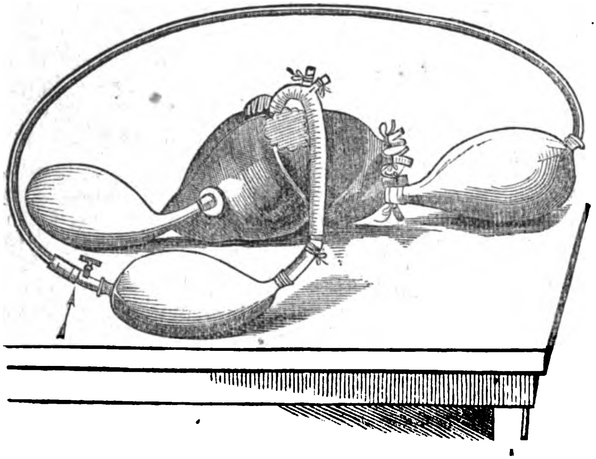
Relative Position of the Large Vessels to the Parietes.—Aorta.—The ascending portion of the arch of the aorta comes to the right of the sternum, between the cartilages of the second and third ribs. In this part of its course it is within the pericardial sac, and in the dead subject lies at the depth of one inch and a half from the surface, the margin of the right lung and the pericardium being between it and the parietes of the chest. The transverse portion of the arch of the aorta crosses the trachea at the centre of the first bone of the sternum, on a line with the lower margin of the articulation of the cartilages of the first ribs with the sternum, and at a still greater depth from the surface. The arch of the aorta approaches most closely to the parietes at the point at which the arteria innominata comes off; that is, on a line with the junction of the cartilage of the second right rib with the sternum.

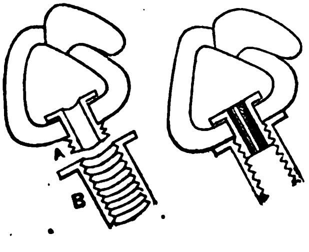
Pulmonary artery.—The origin of the pulmonary artery is on a line with the junction of the cartilages of the third ribs with the sternum; the tip of the left auricle resting against its left side; it ascends about two inches before it divides; and a portion of the margin of the vessel here comes to the left of the sternum, between the cartilages of the second and third ribs. The division of the artery is on a line with the upper edge of the cartilage of the second ribs, where they join the sternum, the apex of the pericardial sac being on a line with the junction of the cartilages of the second ribs with the sternum, though it is sometimes higher up, and on a line with the cartilage of the first ribs.—*Med. Gazette, Feb.* 15, 1850, *p.* 270.

37.—ON THE CAUSE OF THE SOUNDS OF THE HEART.—By HARRIS C. BRAKYN, Esq., Dublin.

[Mr. Brakyn, a Dublin student, having adopted Dr. Billing's theory of the sounds of the heart, invented a very ingenious apparatus with a view of experimentally demonstrating its truth. After exhibiting this apparatus before Prof. Fergusson, Dr. Stokes, Dr. Lees, and many other Dublin gentlemen, Mr. Brakyn communicated an account of his experiment to Dr. Billing in a letter from which the following is an extract:]

I have still preserved in my possession the apparatus used on the last-mentioned occasion, which consists of an ox-heart carefully dissected from the animal, so as to avoid injury to any of the appendages. To this (as displayed in diagram) I attached an apparatus consisting of a flanged



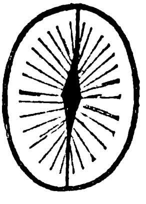


tube, *a*, attached to the middle of left ventricle, and piercing its wall, introduced through the auriculo-ventricular opening, to which was screwed externally another tube, *b*, with a flange also, so as to grasp the wall of ventricle all around the tube, and render the junction air tight; to the outer tube a bladder is tied. A free communication is thus established between the bladder externally and the cavity of ventricle within. To the left auricle, a similar apparatus, but without flanges, was then attached by one trunk of the pulmonary veins, the rest being tied. Then having tied all the offsets of the aorta, I tied a tube and bladder to its abdominal extremity; to the distal end of this a small stopcock was then tied, into which a brass pipe fastened to the end of an india-rubber one can be wedged; the other extremity of the caoutchouc pipe is finally attached to the distal extremity of the auricular bladder. There is thus completed an apparatus permitting a mimic circulation through the left heart, (*it* being sufficient for illustration,) which may be conducted with great ease in the following mode: Let the system be inflated with air through the orifice of the elastic tube next stop-cock (marked by an arrow in diagram); when having wedged back the stop-cock into the pipe and opened the cock, a rythmical circulation may be carried on by alternating manual pressure applied to each of the three bladders in succession (without removing *any* of the *three* hands applied)—thus *representing* the successive contractions of auricle, ventricle, and aorta, with the natural attempts at regurgitation, which close both sets of valves in succession. Hereby a complete imitation of the normal sounds may be produced on either a very magnified or diminished scale, according to the force used in propelling the air.

These sounds being produced without any muscular contraction, or rush of blood, &c., must evidently be *valvular*, which can be further demonstrated by removing part of the apparatus, (the auricular,) so as to show the mitral valves in action synchronously with the first sound; or by introducing a wire cage, prevent them closing on regurgitation, when no sound follows: above all, the first sound is as perfect as the second, the valvular origin of which is, I believe, undisputed. In fine, the illustration, though conducted with air, ought to be conclusive, inasmuch as a suddenly strained membrane, which gives a tympanitic sound in air, will do the same in water also, as I have tried, but not so loudly.

Dr. Stokes, also, in subsequent conversations with me, mentioned a fact which he had noticed several times in typhus fever, and which he seemed to think likely to favor your doctrine—viz., that patients, after the fever had progressed sometime, and great debility had supervened, ceased to have any sound at the heart, though circulation continued. Sometimes, however, the second continued, the first being absent; but it was to be remarked in these cases, that the impulse of the heart was quite absent. This, no doubt, Sir, the muscular theorists would endeavor to appropriate, as well as the supporters of your opinions. I imagine, however, that this additional fact would not be so easy of digestion to the former gentlemen, which is, that as the patients improved, impulse was found to return, often with considerable energy, but unaccompanied for some days by any sounds, or, in some instances, by the second only. This state of things can be also imitated most accurately by the bladder apparatus.

I also endeavored to try the experiment with water, but did not succeed for want of a proper hydraulic apparatus of adequate power, which would have been too expensive and laborious an undertaking for me to have ventured on. I should have mentioned before, a fact of some interest in connexion with the character of sound produced by the valves—namely, that when the mitrals were made to act whilst exposed to view, the sound could be produced by the sudden straining of the valves, when the ventricular bladder was pressed, even though the valves had been previously in contact, or with a very minute orifice existing by their partial patency, such as in the accompanying diagram. This fact would seem to me to disprove



the statements made in several works of eminence, that the second sound is produced by a click of the sigmoid valves; the first being regarded by such authors as muscular, whilst the above fact must, I think, prove your assertion of both being "tympanitic." *Lancet, Nov.* 24, 1849, *p.* 564.

[Mr. Brakyn having intimated in the letter from which the above extract is taken that Dr. Stokes considered his experiment conclusive, the latter gentleman has written to correct this, which, he states, is an inaccurate statement. He says.]

I did not admit the conclusiveness of the experiment, particularly with reference to the first sound.

There is another point in Mr. Brakyn's letter which I must take leave to correct. It is, that in case of softening the heart in typhus fever the impulse is found, on the recovery of the patient, to return with considerable energy, but unaccompanied for some days by any sounds, and in some instances by the second only. In the investigation which I have published on the state of the heart in typhus fever, I have shown that in a few cases a returning impulse is perceptible before the development of the first sound; but the statement, that the heart may act with considerable energy for days, without producing any sounds, is altogether opposed to fact. *Lancet, Dec.* 15, 1849, *p.* 647.

[Dr. S. Wilks, of Camberwell, states that he has repeated Mr. Brakyn's experiment, but without such success as that gentleman met with. He says:]

The second sound of the heart is very conclusively shown to be dependent upon the closing of the sigmoid valves; but on this I shall not dwell, as all controversy on this point has for a long time ceased. It was, I presume, to discover the cause of the first sound that the experiment was instituted.

The sound produced by the forcing of air into the ventricle, was certainly a lengthened one, but had nothing of that character about it that would mark it as the production solely of the shutting of the mitral valve; in fact, as I afterwards ascertained, regurgitation always took place in the auricle, and it was to the air rushing over the edges of its membranous curtains that my sound was no doubt in part due; and also, I may add, to a third cause, and which was the rush of air into the aorta. I by no means wish to assert that these causes operated in Mr. Brakyn's case, or that the sound he produced was not exclusively the result of the tension of the mitral valve, but I only wish to state, that having endeavored to prove this myself, I have twice failed, and in all probability should do so again, for it seemed a matter of the utmost difficulty to drive a current of air into the ventricle with sufficient force, and in the proper direction, so as to close the valves suddenly and perfectly, seeing how they are fixed to the columnæ carneæ, which, in a post mortem state, are rigid, and not readily admitting of extension. By opening the auricle to observe the valves, I found they never once perfectly closed, and even when placed nearly in apposition, they would not approximate when the current was directed upon them, without some air passing between and causing their vibration.

As regards the operation of the other cause, my experiments showed that when the mitral was shut, the projection of air into the aorta was also productive of a sound, and other observations have proved the fact that a noise is always caused by the injection of air or liquid into a tube. It should be remembered that by laying the valve open probably the aorta was quite occluded. That our attention should be turned to the flow of blood into the aorta as a probable partial cause of the first sound is shown by the interesting case of the child with its heart developed externally, which came under the notice of M. Cruveilhier, and in which instance he invariably heard the first sound loudest at the origin of the aorta, as though proceeding from, and having its rise at that spot. Because the second sound is undoubtedly caused by valvular tension, that therefore the first is so caused also is not a logical sequitur, seeing how the mitral is fixed by muscular bands and surrounded by dense muscular walls, and not free to vibrate as are the sigmoids contained in a hollow tube with elastic walls. As a question merely of sound, for the reason that one might anticipate the sharp second as the result of valvular tension, so would the first appear more in accordance with that produced by a rush of blood than by the closing of a valve. Although I should place Mr. Brakyn's experiment before my own, on account of his many observations, and believe that the tension of the mitral valve did produce a large part of the sound, yet the difficulty of excluding the operation of other causes in my own case would make me rather incredulous whether they might not have some weight even in his, particularly as other observers would show a part of the causes residing elsewhere.

It will be seen I have referred merely to the practical part of the experiment, but there still remains a question of after-reasoning and which is—What is the value of the experiment? Supposing the sound produced by Mr. Brakyn to have been wholly caused by the tension of the mitral valve, it does not follow that it is the same as the ordinary sound during life, for it is very possible that the sound produced in air, although resembling to the ear the natural one, is really not the effect of exactly the same cause, but equivalent to a valve acting in fluid plus the sounds arising from one or two other sources.

For all these reasons, and particularly the last, I cannot look upon the experiment as conclusive; besides, as I should have before mentioned, other experimenters have shown the sounds to be produced in a living heart when the valve was prevented from acting.

I may remark, in conclusion, that the second sound was certainly well illustrated by this clever experiment, and also many varieties of bruits might be produced by violently forcing the air back through the valves, so as to cause them to vibrate with different degrees of force.—*Lancet, Jan.* 19, 1850, *p.* 98.

38.—ON THE CAUSE OF THE SOUNDS OF THE HEART.—By Dr. O'BRYEN BELLINGHAM, Physician to St. Vincent's Hospital, Dublin.

Theory of the sounds of the heart most generally received.—The theory of the mechanism by which the sounds of the heart are produced, which is most generally received, is as follows:—

First sound.—The first sound of the heart is regarded as a compound sound, partly valvular and partly muscular, the valvular portion being its first and loudest part, and being due to the sudden tension or closure of the mitral and tricuspid valves. The muscular portion of the sound, which is dull and prolonged, is supposed to be caused by the contraction of the muscular fibres of the walls of the ventricles, and to be due essentially, according to Dr. Hope, to "muscular extension," but receiving a "prolongation, and possibly an augmentation from bruit musculaire;" according to others, to bruit musculaire alone, or to friction between the fibres of the muscular tissue of the ventricles.

That this sound is partly due to the sudden closure of the mitral and tricuspid valves, is considered to be proved "by the sound being loudest over the parts of the ventricles nearest to the auricular valves;" 2dly, "when valvular extension was prevented by holding the mitral valve open (in experiments upon animals,) this greatly diminished the first sound;" 3dly, "whenever the auricular valves were destroyed, or the blood evacuated out of the ventricles, the sound became dull and obscure;" and lastly, by the character of the first sound in dilatation with attenuation of the ventricles, when it closely resembles the second sound.

That the first sound of the heart has its cause, likewise, in contraction of the muscular fibres of the walls of the ventricles, is considered to be proved by the "character of the sound,"—by its continuing during the entire systole—by its being still heard, although weaker, in the heart of animals, removed from the body,—"by its being heard although modified, in animals, when the auriculo-ventricular valves were prevented from acting, or when the blood was prevented from entering the cavity of the ventricles by pressing upon the orifices,"—"by the sound being louder over the surface of the ventricles than over the origin of the large arteries,—and finally, by the sound being loud and short, when the walls of the ventricles are thin; and dull and prolonged when its walls are thick;" because a thick ventricle, cæteris paribus, takes a longer time to contract than a thin one.

Second sound.—The second sound of the heart is supposed to be due either to the sudden closure of the valves at the orifice of the aorta and pulmonary artery, owing to the recoil of the blood upon them at the moment the ventricular systole ceases; or to the shock of the column of blood in the aorta and pulmonary artery, which recoils upon these valves at the moment of the ventricular diastole. This theory is supposed to be proved "by the second sound of the heart being loudest over the sigmoid and semilunar valves, and a little above them"—"by the sound ceasing in experiments made upon animals, when the reflux of the blood upon the semilunar valves was prevented by compressing the arterial orifices with the fingers"—and "by its being diminished when a semilunar valve in one artery was hooked up, and replaced by a murmur from regurgitation when the same was done in both arteries."

Remarks on the foregoing theory.—The foregoing theory, it will be observed, omits from the elements capable of producing the sounds of the heart, all consideration of friction between the blood and the parietes of the orifices of the heart, in its passage into and out of the ventricles, during their systole and diastole. Yet when we come to describe the abnormal sounds heard in diseased states of the valves and orifices of the organ, we shall find that this very element, which is rejected as incapable of producing the normal sounds, is set down as the one which almost exclusively gives rise to the abnormal sounds of the heart. Now when we consider the force and rapidity with which the blood is propelled by the ventricles, particularly by the left, there can be no doubt that there is a considerable degree of friction between the blood and the parietes of the orfices through which it passes; and that this can scarcely happen without producing sound, appears evident, because even a slight impediment to the current of blood is sufficient to convert the normal first sound of the heart into a murmur.

Thus in experiments made upon large animals, when the calibre of the aorta near its origin was narrowed by pressing upon it during the ventricular systole, the first sound of the heart was converted into a murmur. Again, if the stethoscope is applied over a large artery, a short, slight, single sound is heard at each systole of the left ventricle; but, if pressure is made upon the vessel so as to diminish its calibre, a murmur will take the place of the mormal sound. Again, the blood in its passage through the veins causes no sound appreciable to the ear: under certain circumstances, however, sound is developed in particular veins, when their coats are made tense, and when their calibre is diminished by pressure with the stethoscope. This sound is familiar to us as the venous murmur.

Now, in each of these instances, there is an obstacle or impediment to the passage of the blood, and the increased friction, which necessarily ensues, is sufficient to convert the normal sound into a murmur. It seems probable, therefore, that abnormal sounds are nothing more than exaggerated normal sounds, exaggerated because the friction between the blood and the parts through, or along which it passes, is increased; and if we admit, as the foregoing instances seem to prove, that normal sounds can be converted into abnormal sounds, simply by increase of friction, it seems not unreasonable to conclude that both are developed by the same agency.

In addition, we know, that, in aneurism springing from the arch of the aorta, a double sound is constantly audible, and this double sound remarkably resembles the double sound of the heart; so close indeed is the resemblance, that the second sound of aneurism in this situation is erroneously supposed by many to be the second sound of the heart transmitted to the aneurismal sac. We also know that the first, or the second, or both the aneurismal sounds, are not unfrequently converted into murmurs, which have precisely the character of the murmurs heard in cases of valvular disease of the heart.

Now, in aneurism, in this situation, we have simply a sac communicating with a large artery by a single orifice, which is constantly patent: the sac is traversed by the blood propelled at each systole of the left ventricle, and into it the blood regurgitates at each diastole of the ventricle; yet every variety of normal and abnormal sound developed in the heart, with its muscular walls and valvular apparatus, may be produced also in an aneurismal sac which has neither the one or the other. It is scarcely, therefore, unreasonable to conclude, that the agent which is capable of generating sound in the one case is capable of developing analogous sounds in the other; and that, as sounds almost precisely similar to those of the heart, in its healthy as well as its morbid state, can be produced independent of valvular extension, or muscular contraction, the latter are not such essential agents in the production of the heart's normal sounds as is generally supposed.

[Dr. Bellingham, then, attributes both the heart's sounds to friction between the blood and the parietes of the orifices through which it passes. He thus explains them :]

First sound.—The first sound of the heart we know is synchronous with the ventricular systole: in this act, the blood, compressed by the contraction of the powerful muscular walls of the ventricles, is propelled with considerable force into the aorta and pulmonary artery, the sigmoid and semilunar valves of which are suddenly elevated. In the rapid passage of the blood from a wider to a narrower area, there must be considerable friction between this fluid and the parietes of the arterial orifices; quite sufficient, in my mind, to produce the prolonged first sound of the heart. This sound necessarily has a distinct character from the second sound of the heart, because the resistance to be overcome is so much greater, and the passage of the blood through these orifices is more gradual; it is likewise more prolonged, because sound must be developed during the entire period that the blood is passing from the ventricles into the large arteries: and the slower the action of the heart, the more prolonged will this sound be.

Second sound.—The second sound of the heart we know is synchronous with the ventricular diastole: during this act the muscular fibres of the ventricles are relaxed, the cavity of the ventricles enlarges, and the walls of the ventricles re-expand; the curtains of the auriculo-ventricular valves open, and there is a sudden influx of blood from the auricles through the auriculo-ventricular orifices. It is scarcely necessary to say that it is not the contraction of the auricles which propels the blood into the ventricles at this period of the heart's action; nor is the dilatation of the cavities of the ventricles the result of the entrance of the blood from the auricles, as some have supposed. It is not, either, necessary for the production of this sound that the diastole of the ventricles should be an active process like the systole; the ventricles being hollow muscles, the state of relaxation of their muscular fibres is a state of dilatation of their cavities: hence a vacuum would be created in them if the auricles were not at this period full of blood ready to supply them; but as the latter had been filling during the whole period of the ventricular systole, this cannot happen, and the blood passes through the auriculo-ventricular orifices in a full and rapid stream, and with sufficient force to generate sound.

That the blood enters the ventricles with considerable force, would appear from what has been observed in experiments upon animals, as well as in the human subject. Cruveilhier says that, in a case of ectopia of the heart in an infant, when the organ was grasped with the hand during the ventricular disatole, it was violently and forcibly opened,—so much so, that he was at first under the impression that the diastole was the active state of the ventricles.

The second sound of the heart is much shorter than the first sound, because the relaxation of the muscular fibres of the ventricles in the diastole is rapid, and the motion is sudden and instantaneous. It has a different character from the first sound, because the blood has no impediment to overcome in entering the ventricles from the auricles.—*Med. Gazette, March* 29, *and April* 12, 1850, *pp.* 532 *and* 617.

39.—ON THE RAPIDITY OF THE CIRCULATION OF THE BLOOD.—By Dr. BELLINGHAM.

The rapidity with which the blood passes through the system can be estimated if the amount which is transmitted into the aorta at each systole of the left ventricle is known, and if the entire quantity of blood contained in the vessels is determined—the number of pulsations of the heart being given. Thus it has been estimated that the whole amount of blood contained in the vessel is about twenty-eight pounds; and that an ounce and a half is expelled at each systole of the left ventricle. If, then, the heart of the adult beats seventy-five times in a minute, 112½ ounces, or a little more than seven pounds of blood, would pass through the ventricle in a minute: in four minutes the entire twenty-eight pounds would pass through the heart; and in every hour it would pass through it fifteen times.—*Med. Gaz., Mar.* 1, 1850, *p.* 359.

40.—SUMMARY OF THE PHYSICAL SIGNS OF VALVULAR LESONS OF THE HEART.—By E. A. PARKES, Physician to University College Hospital.

[The following summary of the physical diagnosis of valvular diseases, is from a clinical lecture by Dr. Parkes.]

I. *Mitral insufficiency*, presenting all its characters in perfection, gives us—

1. A systolic murmur, having its maximum over the left apex, or just outside this, and being followed generally by a second sound. 2. An accentuation of the pulmonary second sound—the aortic second sound weakened. The accentuation of the pulmonary second sound may not occur if there be coincident *tricuspid* insufficiency. The weakening of the aortic second sound is said to be most marked in old cases in which the size of the aorta is often notably diminished. 3. The signs of dilated hypertrophy of the left side—sometimes those of the right side. 4. The signs of pulmonary congestion from reflux. 5. Thrill at the apex. 6. A feeble, small, and unequal, but not necessarily an irregular pulse. The smallness of the pulse often contrasts with the vigor of the heart's impulse.

Such a disease, when uncomplicated, is not attended by dropsical symptoms, or by any signs derived from the general venous system.

(*a*) Of these physical signs, the two last may be eliminated without weakening the certainty of the diagnosis; nor without at least two others, are they of the least diagnostic value for this special lesion. (*b*) If there be no evidence of pulmonary engorgement, that is, cough, hæmoptysis, (not dependent on its other known causes,) expectoration, &c., nor of dilated hypertrophy, the diagnosis of mitral insufficiency still remains sound, if, with a systolic murmur at the left apex, the pulmonary second sound be more accentuated, than can be considered normal, even in those who present naturally a sharp pulmonary second sound. (*c*) If the only sign be a systolic murmur at the left apex, this proves, in all probability, disease and alteration of the mitral valve, but perhaps not necessarily regurgitation. This statement is opposed to the usual rule laid down by writers, and especially to the opinions of Hamernjk, and is not to be considered a certain one. In fact, I have not scrupled, and shall not scruple, to speak of systolic murmur at the left apex as diagnostic of mitral insufficiency. But there are some cases on record, and in this hospital we have lately seen two, in which thickening and vegetation on a competent valve, apparently produced the systolic murmur. (*d*) Occasionally, but rarely, mitral regurgitation is unattended by any murmur, and must then be diagnosed by its other signs, if present. If not present, the disease is latent.

II. *Mitral contraction* is diagnosed with much greater difficulty. The following are the signs sometimes noted:

1. A diastolic murmur at the left apex. 2. Pulmonary congestion and hæmoptysis. 3. Second sound in pulmonary artery sharpened (unless there is also *tricuspid* insufficiency) in the aorta enfeebled. 4. Frequently consecutive enlargement of the right heart. 5. If there be no absolute diastolic murmur at the apex, there may be several sounds, two or three, following the systolic sound. Sometimes these may be reduplications only of the normal second sound, but often they proceed apparently from the mitral valve itself, and are, perhaps, attributable to cleavage of the first sound or such moiety of the first sound may be heard with a second sound. 6. There is sometimes purring tremor at the apex. Dr. Hope thought it never occurred, but it has been recorded. 7. The pulse, as in mitral regurgitant, is weak, unequal, and, from accompanying general dilatation of the heart, may be irregular.

A co-existent systolic murmur is very common, from accompanying mitral insufficiency. Frequently the diastolic sound is wanting; perhaps from the nature of the contraction, perhaps from the feebleness of the current of blood. The pulmonary symptoms which are present, may appear referrible to a co-existent mitral regurgitant disease, and it then becomes almost impossible to diagnose mitral contraction. In such a case, the flow of blood through the aorta, as judged of by the character of the aortic second sound, and the state of the pulse, may be more impeded than can easily be accounted for by the existent mitral regurgitation. Then we may suspect, and carefully examine again for, mitral contraction.

III. *Tricuspid insufficiency* may give the following signs:—1. A systolic murmur at the right apex; 2. Pulsation and refilling from below of the external jugulars; 3. Signs of hypertrophy, and dilatation of the ventricle, and often of the auricle; 4. Second sound at the right apex often lost; the cause of the deviation from the common rule in mitral insufficiency is obscure. It may depend on a lessened column of blood in the pulmonary artery.

The almost inevitable consequences of any amount of tricuspid regurgitation are impediment to the general circulation and anasarca. The systolic murmur is not always present; nor the the jugular pulsations; but if there is decided evidence of dilated hypertrophy of the right heart, and general anasarca, which cannot be referred to another cause, then the diagnosis may be made of tricuspid disease, either regurgitant, as it almost always is, or obstructive, as it is in some very rare instances. If, in such a case as dropsy, there are no signs even of dilated hypertrophy, then the general venous congestion may be owing to an exceedingly weak and dilated heart. Often the diagnosis of tricuspid insufficiency must be drawn altogether from the general symptioms.

IV. *Tricuspid contraction* is so rare a disease, that its signs are not yet known. A diastolic murmur at the right apex from this cause has not, to my knowledge, been recorded. Possibly we might suspect such a lesion, if, to the signs of general dropsy, there were joined evident dilatation of the right auricle without the signs of ventricular hypertrophy, and without the murmur of tricuspid insufficiency.

V. *Obstructive Aortic disease.*—1. A murmur at the base, with its maximum over the valves, or just above, and carried along the aorta. If the contracted orifice be very smooth, the murmur may be wanting. 2. Hypertrophy of the left ventricle, in a degree determined by the extent of the contraction and the general health and occupation of the individual. 3. Aortic second sound very weak, even wanting, but not superseded by murmur. 4. Occasional purring tremor. 5. Pulse unaffected, till contraction be extreme, then small and rather hard, not soft and unequal.

Very nearly the same signs may be given by roughness of the lining membrane of the aorta, by dilatation or aneurism, by pressure from a tumour, or even from a tuberculous lung; only in such cases, if the valves are healthy, three circumstances will often fix the diagnosis: 1. That the sound is at its maximum above the valves, and is hardly at all heard below them. 2. That the aortic second sound is of good tone. 3. That the morbid sound is carried a long way down the aorta, and can often be heard better in the back than over the heart. Hamernjk, of Prague, doubts whether a murmur will arise from a roughened aorta, but this cause is usually admitted in this country, and I believe properly so.

Systolic murmurs may arise at the aortic orifice and in the aorta in some cases in which there is no reason to suspect organic change, viz., in anæmia, in typhoid, and probably in typhus fever, in puerperal fever, and it is said in the exanthemata. So also in cases of pressure from below, as in abdominal tumours and pregnancy, or from the side, as in some cases of tumour not directly pressing on the aorta, inorganic murmurs will occur. It is not always easy to diagnose these from aortic disease, except in the case of anæmia. An inorganic murmur thus arising, is called by Hamernjk "diffuser ton," but the murmur is often as perfect as any arising from obstruction. It is said, that in rheumatism a murmur will occur at the aoritc orifice, without endocarditis.

VI. *The signs of aortic insufficiency* were given at the last lecture. I need only mention one more of little importance, viz., a lengthening of the interval between the heart's impulse, and the beat at the wrist. Neither of these diseases of the aortic mouth are necessarily attended by obstruction to the general circulation.

VII. *Obstruction and regurgitation at the pulmonary* orifice are very rare. The signs of such states will be analogous to similar conditions of the aortic orifice.

Such being the general summary of the physical signs, the following provisos should be born in mind in examining cardinac affections.

1. These rules pre-suppose that the heart is in its natural position, has an unchanged axis, and is not to an abnormal extent covered or uncovered by lung; in fact, that there are no circumstances present which may falsify, so to speak, the elements of the problem. If such changes are present it must be seen what amount of uncertainty they cause in the diagnosis.

2. In the matter of murmurs more especially, it should be always remembered, that to cause vibrations of valves and murmurs, a strong current of blood is necessary. If, therefore, with an extremely feeble heart, there are no murmurs, we cannot say that there is no affection of the valves with the same certainty, as if with a strong powerful heart, and a good current of blood, there was an equal absence of murmur. In this last case

we might be all but certain there was no valvular disease, but not so in the former case. Therefore, with an extremely feeble heart, the diagnosis must be qualified. You will find it stated by a writer of authority on diseases of the heart, Dr. Blakiston, that mitral regurgitation is "sometimes, but not often," accompanied by systolic murmur at the apex. I must confess, that as far as I have myself been able to examine cases, and to consider those recorded by others, I should doubt whether this statement is not too broadly put. It appears to me, that except in cases of manifestly weak hearts, or failure of circulation from arrest of the current of blood, if the other signs of mitral regurgitation exist, the systolic murmur at the apex is never or very seldom wanting. Among the great number of instances of systolic murmur at the apex which daily present themselves, the difficulty, it appears to me, is to decide whether the murmur is to be referred to regurgitation, or to other conditions of the mitral valve, not involving insufficiency. But there is seldom any difficulty in finding the murmur in decided insufficiency.

3. When two or more cardiac diseases are combined, the signs may be slightly modified; thus, extreme mitral regurgitation, with a rather weak heart, may prevent an aortic obstructive or regurgitant murmur, by greatly diminishing the flow of blood through the orifice. Such a condition, however, does in reality fall under the rule given above. Again, tricuspid insufficiency may prevent any increased sharpness of the pulmonary second sound in mitral insufficiency.—*Med. Times, Feb.* 23, 1850, *p.* 131.

41.—CONCLUSIONS RESPECTING VALVULAR DISEASES OF THE HEART.—

By Dr. A. W. Barclay, Physician to the Chelsea, Belgrave, and Brompton Dispensary.

[Dr. Barclay makes the following deductions from the analysis of a large number of cases occurring at St. George's Hospital:]

1. Liability to double valvular disease is a consequence of rheumatic endocarditis; and this disease may attack at an early period of life, and terminate fatally at an early period. 2. A decided limit appears to be set by age to fibrinous deposit on the valves of the heart. 3. Atheromatous disease affects not by preference the mitral valve, as has been sometimes stated. 4. Though endocarditis is most commonly an acute disease, originating in connection with acute rheumatism, yet it appears that the endocardium or lining membrane of the heart is liable to become the seat either of chronic inflammation and its effects, namely, thickening and induration with corrugation of the valves, and arctation of their apertures, or of atheromatous deposition. 5. After this condition of the endocardium and valves has been insensibly established, an acute form of the disease may supervene, or hypertrophy or dilatation may ensue. 6. A large proportion, that is, nearly one-half of the fatal cases of granular kidney, is found coincident with valvular disease; but valvular disease is rare in those cases in which the kidney is large and mottled. 7. As a corollary from deduction 6, it must be admitted as probable, if not certain, that the large mottled kidney is a different disease from the granular or hard, and usually small kidney.

Points requiring farther investigation are the following:—

1. Whether the double valvular affection be the immediate, or the remote consequence of rheumatic endocarditis; and from what circumstance the disposition to renewed attack of the disease is derived? 2. Whether endocarditis ever proceeds from the enlarged and mottled state of the kidney as its sole cause; and why, among so great a number of cases connected with granular kidney, the inflammatory action was not more frequently found recent?—*Edin. Med. and Surg. Journal, April* 1850, *p.* 344.

42.—ON COMPLICATIONS OCCURRING IN THE TRAIN OF CHRONIC CARDIAC DISEASE.—By Dr. A. H. Douglas, Physician to the Edinburgh Infirmary.

There is great variety in the manner in which pulmonary complication is associated with disease of the heart; its influence, however, is under all circumstances, most formidable, and it demands direct and active treatment. It is not always possible to determine whether the pulmonary lesion originated the existing attack, or whether it arose *late*, and as a sequence of the disordered circulation: but this does not involve any practical difficulty. The complication never exists in a simple form; hence the uncertainty of its indications during life. Bronchitis is rarely wanting, and it has an admitted relation to the disease of the heart as an effect; pleurisy and pneumonia usually co-exist, and the signs of the former more or less mask those of the latter. It is in such cases that blistering is serviceable—subduing pleurisy as well as bronchitis. The chronic affections of the heart itself are not benefited by counter-irritation: but relief of the respiratory function impeded from pulmonic complication by counter-irritation or otherwise, goes far to diminish obstruction of the circulation.

Decided jaundice does not arise frequently in the progress of diseases of the heart; and, considering the direct influence of the obstructed circulation on the liver in all the forms of disease of the heart, this is remarkable. I do not remember to have met with it, except in two cases; in both of these cases it occurred shortly before death, and no treatment had any effect upon it.

In former cases it has been shown, that the condition of the right ventricle exerted a powerful influence on the state of the circulation; and it has been argued that a patent state of the right auriculo-ventricular communication is a chief cause of the obstructed state of the circulation, which I have been led to connect rather with general dilatation, possibly, of *one*, probably of *both*, ventricles. It has been almost established, that a degree of incompetence of the tricuspid valve is not inconsistent with health; and I believe that the higher degrees of widening of this aperture arise only in connection with dilatation of the right ventricle: and, moreover, there ordinarily co-exists more or less dilatation of the left ventricle. It is impossible to attribute the obstruction of the circulation to one of these lesions to the exclusion of the others; but, if one has a primary importance, I believe it is the dilatation of the ventricles.

Valvular disease of the right side of the heart is admittedly rare.

The physical signs of valvular incompetence require little notice—they are for the most part well understood, though the value of some has been over-estimated. Confusion has arisen from importance being attached to the character or tone of the endocardial murmurs: their true diagnostic value depends upon two circumstances—the *position* in which they are most distinctly audible, and their relation to the *rhythm* of the heart's action. It matters not whether endocardial murmur be musical, grating, or soft and blowing, with the exception already indicated in contraction of the mitral orifice, in which the characteristic murmur appears to have a *harsh grating* character. In illustration of this point, I shall only refer to two cases which have been brought under my notice; in both, incompetence of the aortic valves was attended by a murmur so loud and shrill that it was audible at a distance of several inches from the surface. But the nature or seat of the disease in these cases was determined solely by the *position* and *rhythm* of the murmur, which existed, as in all such cases, at the *base* of the heart, with the *second sound*. The musical character or loudness of the murmur was connected with the intensity of the vibration, caused by the regurgitant current, which was accompanied in both cases by a vibrating *fremitus*—a sign not usually observed in aortic incompetence.

The various changes which the pulse undergoes are more intimately related to changes of the muscular substance, than to valvular lesions. There are conditions of the pulse which depend only upon valvular disease; but these may be limited to two—the small pulse of mitral or aortic contraction, and the quick diastolic pulse of aortic regurgitation.

The *visible* pulse is not always an abnormal condition; but, even in its higher degrees, it has no relation to valvular disease. *Irregularity* has been regarded as significant of mitral incompetence; but it frequently exists in cases where there is no valvular disease; and it occurs with mitral incompetence, in such circumstances, as lead me to believe that it arises only in consequence of superadded dilatation.

Want of *synchronism* of the arterial pulse with the heart-beat has a doubtful connection with valvular disease; it does not occur, except in conjunction with more or less dilatation; and I have met with it altogether apart from valvular disease.

Delay of the radial pulse has been stated to depend upon incompetence of the aortic valves; I do not think such is the fact. The radial pulse is naturally more or less posterior to the heart's impulse; and the interval may vary within the limits of health; besides, from the very nature of the thing, it is difficult or impossible to affirm in a particular case that the *degree* of delay is abnormal. From my own observations, I am satisfied that an appreciable increase in the delay of the arterial pulse is very rare; and it does not arise in such a proportion of cases of aortic incompetence as to indicate any relation between them.

Adhesion of the pericardium has been said to manifest itself by a peculiarity of the pulse, which certainly existed in one case; the impulse communicated to the epigastrium, with an undulating and "jogging movement. This state of the impulse accompanies diseases of the heart in which no pericardial adhesion exists; for how frequently do we find that adherent pericardium only reveals itself post-mortem. My own opinion is, that the manifestations of heart disease will arise, in connection with adherent pericardium, only after hypertrophy or dilatation have been superadded.

Monthly Journal, May, 1850, *p.* 450.

43.—ON THE PROGNOSIS OF ORGANIC DISEASES OF THE HEART.—By Dr. C. J. B. WILLIAMS, F.R.S.

[Dr. Williams remarks that though the *diagnosis* of organic diseases of the heart has now become comparatively easy and accurate, yet our knowledge of the *prognosis* and *treatment* of these affections is not by any means in such a satisfactory state. In directing our attention to the subject of prognosis, Dr. Williams shows that the character of the signs is no measure of the severity or danger of diseases of the heart, but that the prognosis is really to be decided by a consideration of other circumstances, which he classifies under two heads:]

1. A structural disease of the heart may be considered serious and dangerous, in proportion as it impairs the power of the organ to carry on the circulation. We may judge of this power both by the physical signs of the action of the heart itself, and by the condition of the circulation at large. The power of the heart to carry on the circulation is represented by its natural sounds; and so long as they are distinct, with their proper characters, of comparative dulness or prolongation of the first or systolic, and clearness or shortness of the second or diastolic,—then, no matter how loud the accompanying murmurs, the heart is doing its work, and there is little ground of present alarm. If, on the contrary, the natural sounds are indistinct, or considerably altered, being too faint to be audible in the usual position, or superseded (not merely masked) by abnormal murmurs,—then, whether there be loud murmurs or not, whether there be palpitation or irregular action or not, whether the impulse be strong or weak, it may be inferred that the heart's action is seriously impaired; and the lesion must be considered of a dangerous kind.

I have notes of more than a score cases, such as the following:—A physician of eminence was consulted on account of a young lady, who had a slight pain in the chest, with moderate palpitation. On applying his ear to the chest, he heard so loud and harsh a cardiac murmur, that he was alarmed, and recommended that I should see her. On examination, I found a very loud, grating systolic murmur, having its greatest intensity to the left of the sternum, between the second and third ribs, where there was a palpable thrill. According to Dr. Hope's rules of diagnosis, this must have been situated in the pulmonary artery; but finding the murmur distinct also in the carotids, I considered it to be in the aortic orifice; this opinion was confirmed by a perceptible thrill in the pulse. But is more to the present purpose, that this murmur, loud as it was, did not supersede the natural double sound; and the impulse, although stronger and more heaving than natural, was not far beyond its proper position. I judged therefore, that there was no present danger; and the regularity and moderate frequency of the pulse, as well as the absence of other serious symptoms, pointed to the same conclusion. This lady had some years previously suffered from some inflammation in the chest, and had ever since felt more or less palpitation on over-exertion. Such an exertion was the cause of her present ailment, which, to her own feelings, subsided after some days' rest and the use of very simple remedies; yet the murmur remained nearly as loud as ever. After being directed to pursue the rational plan of caution against all circumstances likely to derange the circulation of general health, this lady returned to the country quite well, and pursued her usual occupations and amusements. This was six years ago; I have seen her three or four times since, enjoying her usual health; but the murmur remained nearly as loud as ever. In this case, I consider there was a small body projecting into the aortic orifice, and that, although causing noisy vibrations in the current, it did not oppose the passage of the blood sufficiently to disorder the proper action of the heart and its valves. Hence these, in their usual transition from slack to tight, in systole and diastole, still produced their natural sounds; which were thus a proof of the sufficient integrity of the heart in its functions.*

The following case of regurgitant aortic disease bears on the same point. A man, aged about thirty, who had formerly suffered from acute rheumatism, was admitted into the hospital for a slight ailment, attended with palpitation. The remarkable feature of his case was, a very loud musical murmur, of a cooing tone, following the second sound. Although most intense at and near the midsternum, it was distinct in every part of the chest; it could be heard not only in the arteries of the neck, but faintly even in the radial artery of the wrist. This patient was quite a stethoscopic curiosity, and was kept in the hospital on that account, rather than because he required specal treatment. Accordingly, the natural sounds of the heart were quite distinct,—proving a fair performance of the natural function; although the systole, in its duller sound and extended and lifting impulse, implied some degree of hypertrophy of the left ventricle. As far as regarded the heart disease, therefore, in spite of the loudness of the morbid sound, the prognosis was not unfavourable; and we learned from his history, that for several years the noise in his chest had been noticed, when his health had not materially suffered. It happened, however, unfortunately, that he took a prevailing typhus fever, and died in the hospital. On examination of the body, the ventricles were found moderately enlarged and thickened, and the valves all healthy, except the aortic, one of which had the free margin neatly retroverted, so as to leave a fine, smooth chink for regurgitation. Some of those present at the examination, expressed themselves disappointed at finding so little lesion to account for so remarkable a sound; but, considered acoustically, it was precisely calculated to explain the sign, by affording a narrow slit for a uniform refluent jet, producing the rapid, equal, and prolonged vibrations, which constitute a musical tone.

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* This is my explanation of the natural sounds, inferred from the experiments before referred to. The ventricles, with their valves, at each systole, are suddenly tightened on the contained blood, and thus produce the first sound, which is more or less prolonged till the vibrating, and therefore sonorous tension, ends in the diastole; then the ventricles are relaxed, but the parts suddenly tightened now are the arterial valves, which simultaneously closing under the recoiling column of blood, give the second or diastolic sound.

Instances of noisy mitral regurgitation, without dangerous heart disease, are still more common. I have a great many patients on my books, whom I have occasionally seen for several years past, who have the systolic murmur below the left breast, which, in 1835, I proved to be characteristic of mitral regurgitation; and which, provided it merely accompany, and do not greatly supersede the natural double sound of the heart, is by no means so formidable a sign as is generally supposed. In some of these cases, the patients complain less of their heart than of their breath, or their digestion, &c.; in others, nervous palpitation or pain is a troublesome symptom, and aggravates the sufferings and fears of the invalid: but none of these symptoms are adequately proportioned to the cardiac lesion; and they may come and go, whilst this is constant. But so long as the natural sounds of the heart are distinct, and the impulse does not spread far beyond its natural limits, although the murmur be loud and the symptoms distressing, we need not despair of amendment and restoration to moderate health.

In all cases, however, in which the existence of a valvular lesion is proved by the persistence of a murmur, the prognosis must take into account not only the present amount of the lesion, but what it is likely to become; whether it be stationary or progressive; and whether, although now it do not seriously affect the ordinary work of the heart, as evidenced in its motions and sounds, it may not be so increasing, as to tend to interfere with them, and thus to develope dangerous disorder. To detemine this point, we have to consider the recent history of the case, and watch its progress for some time. Thus, if symptoms of disordered action of the heart have manifested themselves only recently, in consequence of an accident, a sudden mental shock, or an inflammatory attack in the chest, then it is possible that the disease, although moderate now, may be on the increase; and even in case of slight lesion, a favourable prognosis cannot be pronounced, until further observation shall prove that there is no tendency to increase. But if the history give no evidence of a sudden or recent affection of the heart, and if examination, repeated after the lapse of a week or so, discover no remarkable variation in the physical signs, it may be inferred, that the lesion is stationary, and may be considered less formidable in proportion as the natural sounds remain unaffected.

With the cases above described, as presenting through their physical signs a favorable propnosis, may be contrasted those of an opposite description, equally declaring themselves by their physical characters. We have seen that it is not the loudness nor harshness of the morbid murmurs, that proves the formidiable nature of a cardiac disease; but rather the degree and mode in which natural sounds are superseded, or changed from that type in which they represent a healthy working organ. Thus when, instead of the natural first sound and impulse, there is only soft blowing or musical murmur, with little or no impulse, or when a murmur of any character supersedes completely the natural second sound,—we have, at once, the proof of a serious and dangerous alteration of structure: and this is commonly, but not constantly, evinced by faintness, distressing palpitation, or irregular action, with other symptoms of failing function in the centre of the circulation. The most formidiable cases of this description, are those in which the valves of an orifice have been broken down, either by some violent exertion, or by a sudden increase of endocarditis or degenerative softening. I have met with several examples of this kind. There had been the signs of a moderate lesion previously,—a murmur accompanying one or both natual sounds; when, after a violent strain, or excessive mental excitement, sometimes with the sensation of something suddenly giving way, the action of the heart becomes tumultuous and irregular, with more or less faintness or oppression; and the sounds of the heart are found to have become changed, the natural sounds being indistinct, the rhythm irregular, and the murmur altered in character, but not always increased in intensity. In other instances, a similar change has occurred less suddenly, but still within a few days, by the rapid destruction resulting from acute endocarditis, or from fatty degeneration of the valves; in such cases, general symptoms of cachexia, and of serious disorder of the blood and excernent function are also present, to give warning of the impending danger; for destructive endocarditis, and degeneration of textures, do not occur in a healthy constitution. But the change in the sound of the heart is heart is here all the more sure token of evil, and the sufferer seldom survives many days, or weeks at furthest.

When the lesion of the valves is slower in progress, and only gradually impairs the natural sounds, its fatal influence is often successfully counteracted, for a time, by the powers of nature. This they can do in slow cases, by developing increased strength and substance in the muscular walls of the heart. The more this is done by simple hypertrophy, without degeneration, or much dilatation, the better will it accomplish its end,—the augmentation of the damaged power of the heart to propel the blood. It is thus that we sometimes find the most formidiable kinds and degrees of organic disease of the heart *gradually* developed, without sacrificing life, and, occasionally, without altogether precluding a limited amount of health. We do, now and then, meet with examples of most frightful amounts of change of structure—the normal sounds superseded by all kinds of unnatural blowing, sawing, or grating noises—the impulse exaggerated into a wide, tumultuous heaving stroke, which, with its almost equally violent diastole, so shakes the walls of the chest, as to give a shock to the whole frame; yet the patients complain of little or no palpitation or discomfort, and have far less of suffering or fear, than most of those persons who are affected with merely functional disorder. By substituting increased force for completeness of mechanism, nature does manage to compensate for the defects for a while, and, under favourable circumstances, to maintain the circulation to a degree that is surprising, considering the amount of the lesion. But this compensatory power is very uncertain and unruly; it is very apt to exceed its due bounds, and further to damage the heart and adjoining vessels by its violence; or to falter and suddenly fail, when exhausted by an unusual effort; so that even these cases, the best of their class, hold life by a very uncertain tenure. The machine, working at a high pressure, to which it is not adapted, may suddenly stop from the expenditure of its power, or soon become worn out by the strain; and thus we are justified in applying a more or less unfavorable prognosis even to chronic cases, where the natural sounds of the heart are materially impaired.

In may cases, the compensatory efforts of nature are even less successful than in those last noticed; the hypertrophy of the walls is frustrated by dilatation, which implies the expenditure of the force on the cavities; or it is vitiated by fatty degeneration, which not only deprives the muscular fibres of their contractility, but renders them yielding and lacerable, and liable to functional failure or fatal rupture. Hence, a dilated flabby heart is the worst addition to valvular disease and may render formidable even that which is not in itself dangerous. In this case, the systolic sound may be distinct, and even loud, and heard over a wide extent; but it is short, and with the brief knocking impulse, expressive of the deficiency of contractile power. The rhythm is commonly irregular, and the pulse very weak and unequal.

2. The second group of circumstances that affect the prognosis of organic diseases of the heart, are those relating to the condition and general circulation of the blood.

The mechanism of the heart is adapted to certain degrees of spissitude and quantity of the blood, and the vital properties of the organ are sustained by its richness and purity. Any considerable deviations from the normal state of the blood, will disorder the action even of a healthy heart, much more that of one, the structure of which is imperfect. Thus, a thin watery state of blood will mechanically exaggerate the unnatural vibrations and regurgitations arising from valvular disease, and will increase the murmurs which these occasion; whilst the vital properties of the heart, being alternately irritated and exhausted by the irreguler quantity and quality of its sustaining fluid, will be still further disordered, and raise the functional disturbance to its greatest possible height.

Hence there are no cases which are more distressing, or seem more alarming, than those of valvular disease combined with *anæmia;* and many such instances have I seen reduced to this condition by the injudicious employment of an antiphlogistic or lowering treatment. But so long as the natural sounds and impulses of the heart are distinct, and there is no evidence of a worse complication than anæmia, although the murmurs may be very loud, the palpitation very violent, the occasional faintness distressing, and all manner of anginal pains and oppression be present, and even although anasarca may have begun to appear, yet these cases are by no means hopeless. In many instances, they improve so much under a soothing and sustaining treatment (including sedatives, chalybeate tonics, and nutritious diet), that the patients sometimes think themselves cured: but the valvular lesion is still detected by its murmur, although its diminished intensity shows that it is of minor importance now that a better state of blood has restored to the heart its proper sustenance. It may be inferred, therefore, that simple anæmia, although often greatly aggravating the symptoms, and exaggerating the signs, of heart-disease, is not a dangerous complication, if it be seasonably and properly treated.

The same observation will apply to *general plethora*, or simple excess of blood. This too, by exalting the vital properties of the heart, and by putting its mechanism to a strain, increases, the intensity of the symptoms of organic disease; and, if uncontrolled, tends to spread its destructive effects. Under such circumstances, the prognosis is unfavourable only when the proper antiphlogistic and sedative treatment cannot be practised, or has been neglected too long: when these are judiciously and seasonably employed, the amelioration of the symptoms, and the diminution of the morbid sounds and impulse, are often very remarkable.

But the most common of all the complications of heart-disease, and the most important to be considered in the prognosis and treatment, is that with *deteriorated quality* of blood. Cachexia and toxœmia, in all their varieties, uræmia, cholæmia, lithæmia, (lithic acid in the blood), oxalæmia, pyæmia, and others, which it would be hard to name, might be exemplified from clinical experience as constituting prominent elements in the history of cases of organic disease of the heart and almost stamping them with the proper indications for their treatment. The subject is too wide to be discussed in full, it must suffice to take the more common examples of blood depraved by the retention of excrementitious matter, in it.

Experienced practitioners have long been familiar with the fact that in organic diseases of the heart, and, in fact, in most chronic maladies, it is of the first importance to attend to the state of the digestive organs, and to the secretions of the liver and kidneys. In truth, so prominent is this practical fact, and so manifestly does disorder of these several organs give occasion to the troublesome symptoms in the heart, that both practioners and patients not uncommonly jump to the conclusion that the true seat of the disorder is the stomach, or liver, or kidneys, and that the heart is only "sympathetically affected." The auscultator avoids this mistake; he is well assured, by the signs, that organic disease exists in the heart; but he will fall into an error of equal practical importance, if he neglect the consideration of those derangements of other viscera which react on the damaged heart, and render its imperfections more serious and distressing. The mode of their influence is, doubtless, in some cases, conveyed through the medium of nerves; and, therefore, may be called "sympathetic:" as where a bit of shell-fish or bitter almond in the stomach instantaneously causes palpitation or syncope, (this may happen without any organic disease, but it is more likely to happen with it). In other cases, the disturbing influence is merely mechanical; as where a stomach inflated with gas, or distended with bulky crudities, presses on the heart; or where an enlarged liver has a similar effect. But most commonly, the medium which conveys the disturbing influence is the blood: loaded with morbid matters, resulting from bad digestion or imperfect excretion, it disorders the various organs through which it is distributed; and none more than the heart, whose injured structure makes it most susceptible of the disturbing influence; hence ensue attacks of palpitation or irregular action, and other symptoms of disturbance, which magnify a disease, before quiescent and scarcely observed, into a distressing and possibly dangerous malady.

Nor is the permanent affection of the heart unconcerned in producing the functional disorders which react thus severely upon it. These may be more or less owing to constitutional peculiarities, or accidental causes; but they are, in part, the result of the disturbed circulation connected with the cardial lesion. This always operates, in some degree, by inducing congestions or irregular flows of blood in the several parenchymatous organs. The lungs, the liver, the kidneys, and the mucous membranes, especially suffer from this disturbance; and, although insufficient to produce prominent symptoms, it sooner or later impairs or disorders their functions. Hence, we find the subject of organic disease of the heart occasionally, and in some instances almost periodically, suffering from biliary or stomach disorders; from asthmatic or catarrhal affections, or from some of those multiform rheumatic, gouty, and kindred ailments that are connected with imperfect elimination by the kidneys. Any additional circumstances, tending further to lower the regular force of the circulation, may prove co-operating causes; such as exposure to cold, undue exertion or fatigue. irregularities of diet, and the like. And under their superadded influence, the exacerbation of the heart disorder will take place sooner, and with greater severity.

The primary pathological condition in the affected viscera thus induced by a heart disease, is generally congestion. Often we have the physical signs of congestion in the lungs, or liver, and, I may add, sometimes in the kidneys. Their functions are then more or less impaired; and in no symptom have we better evidence of this, than in the state of the urine. which generally becomes scanty, high coloured, and occasionally turbid, and in severe cases, albuminous; less commonly, it is pale and watery, As this proceeds, the action of the heart is more deranged, until more or less of a paroxysm of inordinate or irregular action is developed, with the usual distress and increased disturbance of all the functions.

Here we trace the influence of the defective excretion in impairing the quality of the blood, and in developing and aggravating the imperfections of the organ which propels it. In the same case conjointly, in others separately, the liver may likewise suffer, and in its increasing bulk and tenderness, it gives evidence of congestive enlargement; whilst, in many instances, a tinge of the conjunctiva, and even of the skin, porphuria, and various other signs of bilious derangement, afford proof of the presence of bile in the blood. Here the heart soon feels the deterioration of its proper stimulus; and faintness or irregular action, sometimes with a peculiar kind of breathlessness, in the consequence.—*London Journal, April* 1850, *p.* 311.

44.—ON THE USE OF OIL OF TUPENTINE AS A STYPTIC AND ASTRINGENT.—By Dr. Thomas Smith. Cheltenham.

As an *astringent,* in doses varying form 20 minims to a drachm, according to the urgency of the symptoms, and repeated every three or four hours, turpentine is one of the most efficacious remedies which we possess. The best vehicle for its administration, in the first place, is water, flavoured with syrup of orange, or any other agreeable aromatic. It may afterwards be advantageously combined with any other therapeutic agents, which the special nature of the case may require: thus, in epistaxis depending upon rupture of one or more small vessels, and where much arterial blood has been lost, muriated tincture of iron will form a valuable adjunct. In hæmatemesis and other sanguieneous discharges from the bowels, it may be united with compound infusion of roses, sulphate of magnesia, iced-water, and solutions, of tannic or gallic acid. In some forms of hæmoptysis, it may usefully be added to infusions of matico; in hæmaturia, to the decoctions of uva ursi, chimaphila, pyrola, etc.; or to tincture of sesquichloride of iron, etc. In purpura hæmorrhagica, the decoctions or infusions of the barks form with it an excellent adjuvant. In hæmoptysis, it has speedily and effectually arrested the hemorrhage; and is a much safer remedy than lead.

In my experience, there is no single medicine in the materia medica, that can be compared with it as a *styptic*, either as to certainty of action, or to the safety of its effects. It is compatible alike with acids and alkalies.—*London Journal*, *April* 1850, *p.* 328.

DISEASES OF THE ORGANS OF RESPIRATION.

45.—ON THE NATURE AND CAUSES OF THE NATURAL RESPIRATORY MURMUR.—By Dr. Herbert Davies, Assistant Physician to the London Hospital.

[Dr. Davies very justly remarks that the study of the respiratory murmur forms the very basis of the science of auscultation. He therefore enters into the discussion of its nature and causes, at some length. He says:]

As the extent of the disease occuring in the pulmonary organs is, for the most part, measured by the amount of deviation which the morbid murmur presents from the healthy respiratory standard, we must evidently familiarize ourselves, at the outset, with the charcater and limits of the normal pulmonary sounds, before attempting the consideration of the alterations which indicate the presence of disease. On placing a stethoscope over the larynx and trachea of an individual, we at once distinguish, during the act of respiration, a loud, dry, hoarse, hollow, rushing sound, evidently resulting from the passage of a current of air over a surface which presents a considerable degeree of friction to its progress. This sound, which may be readily imitated by placing the middle of the dorsum of the tongue in opposition with the hard palate, and inspiring or expiring with considerable force, may be traced downwards to the point where the trachea passes into the cavity of the chest, when its tone becomes modified and ultimately changed ino one of a totally dissimilar character.

The sound which is audible over the upper bone of the sternum, and very commonly, in thin persons, in the inter-scapular region, at a part corresponding to the root of the lungs, is termed the bronchial murmur and is well imitated, as suggested by Barth and Roger, by blowing into a roll of paper, or across the orifice of a stethoscope; in its character it bears a close resemblance to the tracheal sound, and only differs from it in being softer in its quality and less loud in its intensity. Considerable importance is to be attached to the detemination of the exact limits of the natural bronchial murmur, or tubular breathing, as is it sometimes called. Some diversity of opinion exists among authors upon the extent to which this sound may be heard. M. Fournet limits its seat to the inter-scapular region. Dr. Hughes states that it is sometimes absent in all the localities, (the upper part of the sternum, the inner side of the infra-clavicular and the inter-scapular regions;) but sometimes, when inaudible on the front of the chest, it may still be heard close to the spine, at a level with the centre of the scapula. Dr. Williams extends it "over the space of from one to two inches on each side of the top of the sternum." My own experience, however, leads me to concur in the view adopted by Dr. Walshe—that while the sound in question is frequently distinguished in the inter-scapular space, its seat in front of the chest is limited to the upper part of the sternum; and that any increase in its extent, right or left of that position, is in general to be regarded as an indication of the presence of some morbid condition of the lung. It must not be supposed that because the bronchial murmur is inaudible in health, beyond the positions just specified, that no vibrations occur in the air contained in the further bronchial ramifications; on the contrary, we can have no doubt of the presence of these vibrations, and we account for their being inaudible, from two circumstances—

1. The bronchial ramifications being covered by a layer of lung, whose peculiar visicular murmur masks the true bronchial sound; and

2. The lamina of lung, always containing more or less air, presents a non-homogeneous structure, which stifles, rather than conducts, the bronchial vibrations to the chest-walls.

The latter is perhaps the more effective couse of the two in rendering the vibrations inaudible.

We have an interesting example of the non-conducting nature of non-homogeneous bodies in the following simple experiment, first suggested by Chladni:—

If we fill a tall glass—a champagne glass, for instance—half full of that sparkling fluid, it cannot be made to ring by a stroke on its edge as long as the effervescence lasts, and the wine is full of air-bubbles, but gives a dead, puffy, disagreeable sound. As the effervescence subsides, the tone becomes clearer; and when the liquid is perfectly tranquil, the glass rings as usual; but on re-exciting the bubbles by agitation, the musical tone again disappears. To understand the reason of this, we must consider what passes in the communication of vibrations through the liquid from one side of the glass to the other; and it is clear that if any considerable part of a system be unsusceptible of regular vibration, the whole must be so.—(Herschel,—Art. "*Sound*," Encyclopædia Metropolitana.)

The third species of sound which is due to the current of air traversing the free passages of the lungs, is the pulmonary, or vesicular murmur—a sound which is soft and expanding in character, and is best imitated by gently pronouncing the letter *v* or *f* in a prolonged manner, the air which passes through the orifice between the compressed lips giving a fair resemblance of its tone. The tone is heard most fully in those parts of the chest which contain lung only—the right and left pulmonic regions.

The tracheal, bronchial, and vesicular sounds are each divisible into two periods, corresponding to the times of inspiration and expiration—the tracheal expiratory being nearly as long and as loud as the tracheal inspiratory murmur; the bronchial expiratory is of considerably shorter duration than the inspiratory, while the pulmonary expiratory is at the utmost one-fourth the length of the inspiratory murmur, weak in character, and in a great number of instances entirely absent. The relative duration of the inspiratory and expiratory murmurs is deserving of considerable attention, inasmuch as the first indications of disease are generally exhibited by the alterations which occur in their respective lengths, the vesicular expiratory, for instance, becoming either equal in duration and intensity, and in advanced disease, longer and louder than the inspiratory murmur. Differences will of course be found in the respective duration of the murmurs in different healthy individuals; but it will be sufficient to remember, that in the majority of cases, the times occupied by these sounds are nearly in the ratio of three to one. Thus, if we suppose a healthy individual to breathe fifteen times in a minute, or once in four seconds, the times occupied by the periods of inspiration, expiration and repose, will be one and a half, a half, and two seconds, respectively. Any prolongation of the expiration is made at the expense of the period of rest, which, as disease advances, becomes proportionately shortened, until it is found in many cases to be entirely abolished, when inspiration follows immediately upon expiration, with scarcely any interval of silence. Having studied the characters of these murmurs, let us briefly consider the causes which produce them, and the conditions which affect their propagation or conduction to the thoracic parietes. And, commencing with the inspiratory murmur, I must, in the first place, remind you that the mass of air drawn into the lungs at each inspiration passes entirely through the trachea, and diverging into the right and left bronchial divisions, becomes subdivided into smaller and smaller streams, until the diameter of the terminal vibrating columns is reduced to one-fiftieth of an inch, the diameter of the ultimate bronchial ramifications. A distribution of this kind, which may be compared to the main-pipe and its branches of a system of gas-supply in a town, must evidently be so arranged that the air may travel from the main into its divisions, and from any trunk into its branches, with as little impediment as possible. From numerous measurements of the diameters of the bronchial tubes, which remain permanently open during the entire act of respiration, I have found that the sum of the squares of the diameters of the dividing channels is always greater than the square of the diameter of the tube from which they diverge, and the proportion is maintained in such a manner that the stream of air can suffer but little impediment in the larger tubes from the mode of their division. The further bronchial divisions will not admit of accurate measurement, from their smallness and elasticity, but I think that an observation of the immense number of orifices which lead from them into the proper vesicular tissue of the lung, coupled with a knowledge of the existence of the law in the upper part of the respiratory tract, will enable us to decide upon the probability of a similar relation existing between a small bronchial tube and the ramifications which spring from it. You are aware that the walls of the respiratory tract are lined by a thin smooth membrane which is preserved constantly moistened by the presence of a thin exhalation; that the walls under this membrane are composed of cartilaginous rings, which preserve the open condition of these air-channels, but that this character is gradually lost with the progressive sub-division of the bronchi, until the smaller tubes are found to consist of simple membrane. The ineqaulity due to the rings must be one cause of friction, while the firmness of the walls must tend to increase and maintain the resonance of any sounds which may be formed or propagated within them. Another cause of friction is found in the divisions of the tubes, where their edges, presenting themselves in a direction opposed to the current of inspired air, act as vibrating tongues, which tend most materially to render the loudness of the inspiratory considerably greater than that of the expiratory murmur. The effect of the arrangement of these edges may be readily estimated by the simple act of blowing over the leaf and edge of a leaf of thin paper. The sound produced by the current of air impinging upon the flat surface of the leaf is very slight, but is immediately raised in loudness when the air is directed upon the edge; and from this simple illustration we may form an idea of the part which the multitude of bronchial divisions play in the production of the inspiratory murmur. Another and by no means the least effective impediment to the current of the inspired air, is presented by the natural elasticity or resiliency of the lung—a power which offers considerable resistance to the entrance of atmospheric air, and proportional assistance to its exit from the chest. The nature of this power is seen in the facility with which a portion of the lung, which has been stretched, returns to its natural size, and the rapidity of the collapse of healthy lungs upon the equalization of the atmospheric pressure upon their internal and external surfaces.

There is considerable difficulty in estimating the amount which is capable of being exerted by this passive resistance, although the observation of pulmonary disease, and especially of emphysema, leads us to recognise its importance in the mechanism of the respiratory act. To quote the words of Dr. Carson, the ingenious experimenter upon this subject:—"Two powers are concerned in regulating the movements, and in varying the dimensions and form of the chest, the elasticity of the lungs, and the contractile power of the diaphragm; of these powers, one is permanent and equable, the other variable, and exerted at intervals. The contractile power of the diaphragm, when fully excited, is evidently much stronger than its antagonist, the resiliency of the lungs, but the latter not being exhausted, takes advantage of the necessary relaxation of the other, and rebounding like the stone of Sisyphus, recovers its ground, and renews the toil of its more powerful opponent." To determine the amount of this power, Dr. Carson instituted the following experiment: an apparatus was constructed, consisting of a glass globe connected with two tubes, of which one was vertical, and the other formed in such a manner as to be capable of being closely fitted into the trachea of any animal, the elastic power of whose lungs was required. The tube was placed into the trachea of a recently slaughtered bullock; water was then poured into the vertical tube, until it stood in it at a height of more than one foot above the level of the water in the globe; openings were now made in both sides of the chest, without perforating the pleura pulmonalis,—the lungs immediately collapsed, the water rising, and standing two inches higher than before. Now, as the only forces in action, at this time, were the pressure of the column of water and the contractile power of the lungs, it follows that we have, in this manner, a rude measure of the latter force, when circumstances admit of its full play. Similar experiments made upon sheep, calves, and dogs, proved that the elasticity of their lungs was measured by a column of water, somewhere near one foot in height, while in rabbits and cats it varied from a pressure of from six to ten inches. Dr. Carson having omitted to give us the dimensions of the apparatus employed, we are unable to calculate the exact amount of the pressure exerted in these instances. On referring, however, to Dr. Hutchinson's paper, we find that in pumping air after death into the chest of an individual, a pressure of one and a half cubic inches of mercury, or nearly twelve ounces avoirdupois, upon every square inch of surface, was required to rupture the pulmonary substance, and we may therefore consider this amount to be the average elastic resilient power of the human lung.

From the sketch which I have given of the nature of the inspiratory murmur, we have seen that this sound, the result of friction, originates in, and is propagated along, the whole course of the respiratory tract—that its character and loudness at any point depend upon the velocity and volume of the air at that part, and that the tracheal, bronchial, and pulmonary murmurs are modifications of, and pass gradually into, each other. It may naturally be objected that the bronchial is distinct in itself, and is not observed to shade off into the vesicular murmur. This consideration brings us to the last circumstance which affects the respiratory murmur; I mean, the nature of the pulmonary tissue as a body capable of conducting sound. There can be no doubt that a portion of healthy lung must, like cotton or wool, or any other substance which contains a quantity of air within its meshes or interstices, prove a bad conductor of sound, for any vibrations originating within it will have to pass from membrane to air, and from air to membrane, many hundred times before reaching the surface of the chest. I have already shown the non-conducting power of a non-homogeneous substance in the case of an effervescing fluid, stifling the vibrations of a glass containing it; and I think that the consideration of what I said at the commencement of my remarks upon the respiratory murmur will be sufficient to account for the presence of the vesicular murmur alone in every part of the chest, with the exception of those positions where the bronchi lie close to the thoracic parietes—viz., under the upper bone of the sternum and inter-scapular region.—*Lancet, Jan.* 26, 1850, *p.* 106.

Bronchial respiration.—When speaking of the normal respiratory sounds, I described the character of the bronchial murmur, and stated its position to be restricted to the upper bone of the sternum, and to the inter-scapular region. In disease, this sound may be found to occur in any portion of the chest, and to present every degree of intensity, from a weak, imperfect, and indeterminate tone, to a loud, distinct, and penetrating murmur, which is audible during inspiration and expiration, and in the greater number of instances, of louder intensity during the latter than the former period. From the character of its tone, it has obtained the names of tubular breathing, bronchial souffle, and blowing respiration. Its position may be deeply seated within the pulmonary parenchyma, or superficial, and apparently immediately beneath the thoracic parietes. From the post-mortem examination of patients who have presented, just previous to death, well-marked bronchial respiration, we find the following conditions to be constantly present, and absolutely essential for the production of the sound:—

1. A bronchial tûbe, or space of certain size. 2. Consolidated or compressed lung,—*i. e.*, airless parenchyma surrounding the tube or space. 3. Absence of secretion in the tube or space, so that a perfect freedom of communication may exist between the cavity and the upper part of the respiratory passages.

A portion of lung thus circumstanced will be evidently entirely useless for the purposes of respiration, and we should naturally expect a diminution in the muscular action of that portion of the chest wall which is situated over the diseased pulmonary structure. Dr. Sibson's valuable paper, before referred to, supplies us with a corroboration of the view. In a note, he mentions the following as an instance:—"Dr. Barlow favoured me with the examination of a female affected with pneumonia of the lower lobe of the right lung. The movement over the diphragmatic ribs of the affected side was .1 inch; over the healthy side, .3 inch. The abdominal parietes, which had but little motion below the left tenth rib, actually fell in from .06 to .1 inch over the corresponding point of the right side.

This case is an additional proof that non-motion, or even reversed motion of the diaphragm on the affected side, is often an indication of pneumonia affecting the base of the lung." In many instances I have been able to verify this statement. And I believe we may most safely conclude, that the air circulates but slowly in a bronchus or space which is surrounded by a mass of consolidated or compressed lung, and that the opinion entertained by Andral, of the bronchial murmur being caused by the inspired air impinging with greater than the normal force upon the walls of a bronchial tube situated as above described, rests upon an entirely erroneous supposition. The more common explanation, which considers bronchial respiration to be simply the ordinary sound, normally occurring in the bronchi and abnormally conducted to the thoracic walls, by reason of the better conducting power of consolidated and compressed lung parenchyma, is, in my opinion, insufficient to account for the great intensity of the sound occasionally found in cases of pneumonia and tubercular consolidation. The bronchial breathing is often as distinct as if the patient were blowing direct into the stethoscope, and in many cases as loud as the tracheal murmer itself, and this in a tube which must be considerably smaller than the trachea, and situated at some distance from the chest-wall. This loudness of tone can not be the result of simple conduction, on the contrary, some of the vibrations must be lost in their passage through the lung substance, however homogeneous it may have become, and all of them be weakened by the time they have reached the parietes of the chest. Again, it is impossible to imagine that the normal pulmonary murmur should be able to drown and entirely mask a sound which, as I have already stated, often equals the tracheal and laryngeal respiration in intensity, especially when we remember that the normal expiration is almost inaudible, and therefore incapable of producing such a result.

I would rather adopt the view of Prof. Skoda, who explains the existence of abnormal bronchial respiration upon the principles of the doctrine of consonance; but I would admit, what this author is unwilling to allow, that the sound is transmitted with greater facility through consolidated than through healthy air-containing lung. Zehetmayer gives the following brief account of this author's theory:—"The vibrations which produce murmurs in the larynx, trachea, and bronchi, are necessarily propagated to a column of air, which stagnates in a bronchial tube, surrounded by consolidated lung parenchyma. This column is thrown into similar vibrations, the sound produced in the upper part of the air passages being found to consonate in it with the same strength with which it is perceived at its seat of origin. While now, the respiratory sound is heard merely as a weak murmur in the neighboring healthy part, (the normal lung parenchyma being, on account of its spongy structure, a bad conductor of sounds originating within it,) the sound which extends from the larynx and trachea, becoming concentrated in the blind-ending bronchus, is still further increased by reflexion from the firm walls, and finding a good conductor in the solid lung-substance, reaches the ear of the auscultator with the same intensity as the murmer at the larynx. Bronchial respiration is therefore the consonance of the respiratory sounds of the larynx and trachea in the column of air contained in a bronchus, which traverses a portion of consolidated lung parenchyma." As the natural bronchial expiratory is louder than the natural bronchial inspiratory murmur, so the abnormal expiratory will be louder than the abnormal inspiratory murmur. Consolidation being the chief condition essential to the existence of bronchial respiration, the sound will be found to be present in the second stage of pneumonia, (principally found at the base and posterior part of the lung,) in tubercular solidification of the apices, in bronchial dilatations surrounded by airless parenchyma, in consolidation which results from the coagulation of simple fibrine, (apoplexia pulmonum,) and, in fact, whenever a considerable portion of the cells and smaller bronchi has become blocked up by any kind of solid matter whatever. It must be added, however, that a patch of consolidated lung may be so centrally situated, and so covered by a stratum of healthy lung, as to present no stethoscopic sign, and even no symptom, upon percussion. Although somewhat out of place, I may mention, with respect to the occasional fallacy of percussion, or rather its failure to detect consolidated lung, that an interesting case is recorded by Dr. Graves, in his clinical lectures, where an extensive tubercular consolidation of the apices was attended by a full, clear sound upon percussion, the portions of healthy lung between and above the tubercular masses being sufficient to counteract the dulness resulting from the diseased pulmonary structure. *Lancet, Feb.* 23, 1850, *p.* 228.

46.—NEW MODE OF PERCUSSION.

M. Poirson, intèrne at the Salpétrière, introduced a novel mode of percussion, which consisted in the employment of a common sewing thimble placed on the fore or middle finger, so as to include a small quantity of air between the end of the finger and the bottom of the thimble. This instrument communicates a clearness and intensity to the sounds which enables the physician to detect variations not indicated by the finger alone.—*Med. Gazette, Jan.* 25, 1850, *p.* 163.

47.—ON THE PATHOLOGY AND TREATMENT OF PULMONARY PHTHISIS.—By Dr. J. TURNBULL, Physician to the Liverpool Infirmary.

[Dr. Turnbull believes that there is more evidence than is generally supposed in favor of the curability of phthisis. He remarks that, when patients recover after presenting all the usual symptoms, it is too common for medical men to distrust their diagnosis, and to take the fact of recovery as a proof that the disease could not have been tubercular phthisis. Against this mode of reasoning he protests. Upon the *Pathology* of the disease, Dr. Turnbull makes the following remarks:]

Let us inquire, as brifly as possible, what light has been thrown on the pathology of tubercle, and the changes it undergoes during absorption and transformation, by recent chemical and microscopical researches.

As regards the blood itself, from which it is an exudation or secretion, the only change of any importance which seems to have been yet discovered, is an increase in the quantity of fibrin; but this does not seem due so much to the tuberculous diathesis, as to the inflammation which accompanies the softening of tubercle. The proportion of blood corpuscles is generally below the standard of health; but Becquerel and Rodier have shown that this is a change common to all chronic diseases, and much more marked in chlorosis.

Analysis of tubercle itself has shown, that it consists chiefly of albumen with a little casein and fibrin, a considerable quantity of fat, and some extractive matters, probably the creatine and creatinine discovered by Liebig in the muscles and urine. Dr. Madden thinks that the abundance of extractive matters shows that there is either diminution of healthy excretion, or undue activity of the decomposing forces. The former he has taken as an indication for the use of means to promote the function of the excreting organs—the skin, liver and kidneys. Crude yellow tubercle contains only about two per cent. of earthly salts, and 98 per cent. of animal matter; but when it has undergone the cretaceous transformation, the proportions are reversed, the quantity of animal matter being about 3 per cent., and the remainder consisting of earthy salts, carbonate and phosphate of lime, with a little muriate of soda.

Tubercle being an exudation from the blood of a part of the liquor sanguinis, imperfectly vitalized, and therefore less highly organized than the fibrinous exudations of healthy inflammation, we naturally expect to find —what chemists have discovered in regard to its ultimate analysis—that it differs very little in its composition from the proteine compounds. These facts, it must be confessed, are almost negative, as regards any practical value.

Microscopical researches have thrown more light on the pathology of tubercle; and we have thus derived some information as to its primary seat, its structure, its relations to surrounding parts, and to other deposits of a healthy or morbid character. Dr. Carswell thought that the air-cells were the usual seat of tubercles in the lungs; and that, whenever mucous membrane formed a part of an organ, it was either the exclusive seat, or more extensively affected than any of the other tissues. There seems to be much reason to believe, that the air-cells are the common, though not the exclusive, seat of tubercular deposit. I lately examined a specimen of crude tubercle, where it was beautifully seen filling the cells. Mr. Rainey has described its appearance in the air-cells, and says, that it may sometimes be seen filling only one part of a single cell. He has endeavored to show that the cells are not lined with mucous membrane, but the fact observed by Hassall, of the epithelium extending into them, appears to show that they are lined by this membrane. Different miroscopical observers have shown that it may also be deposited in the intercellular tissue between the air-vesicles; in fact, anywhere external to the vessels; and Dr. C. J. B. Williams thinks it probable, that it may even form within the blood-vessels themselves.

Microscopical examination of tubercular matter has shown that it consists of corpuscles, which are characteristic of tubercle, and of granules and minute molecules. The corpuscles have no nuclei, and are considered to be undeveloped cells, which approach more or less nearly to the exudation or plastic cells of healthy inflammatory deposits. The milary tubercle has some appearance of cells and fibres, but the crude yellow tubercle has no appearance of organization, and during softening, the corpuscles swell, burst, and discharge granules. Dr. Williams's view—that lymph, tubercle and pus, are only modifications of each other—shows how nearly tuberbular deposition and inflammation must approach each other; and pathologists seem now agreed that they are closely allied processes, both being modified states of nutrition. Growth, nutrition, inflammation, and scrofulous diseases, are, observes Dr. Addison, analogous phenomena.

Besides the objects already described, there are also seen in in tubercles the filamentous remains of the air-cells, fat globules, which increase in quantity as the softening takes place, pus, and other exudation products of inflammation, and epithelium cells; and in cretaceous tubercles, large, dark particles, and crystals of cholesterine.

Of these facts furnished by microscopical examination, perhaps the most important in reference to our present inquiry, is that of the tubercular corpuscles being most nearly allied to the fully developed cells of healthy inflammatory products, from which they appear to recede, and assume more of a granular aspect, in proportion as they become yellow and cheesy, or soften. "The miliary tubercle," Dr. C. J. B. Williams observes, "differs from fibrin, not in kind, but in degree, of vitality and capacity of organization"; and this proves to us what experience had previously taught—the importance of removing the complication of inflammation or congestion of the lungs, in the prevention as well as treatment of phthisis.

[Dr. Turnbull proceeds to make the following observations on the *Treatment* of phthisis.]

The researches which have been made in the present day in chemistry and physiology, have tended more and more to prove the connection between deranged assimilation and many diseases; and in struma, Dr. Prout has observed that all the assimilating processes are at fault, but chiefly those which take place between the duodenum and the circulating system, and by which the chyle is converted into blood. It is also well worthy of notice, that tubercles may be produced in some of the lower animals by confining them in damp places, and feeding them on unwholesome food. This was done with rabbits by Drs. Baron and Jenner, and by Dr. Carswell; and it is a fact of some importance, as well in reference to the curability of tubercular diseases by absorption, as in showing the power of good alimentation, that the tubercular disease has been removed by feeding them afterwards on more nutritious food. In some kinds of insects, too, it has boen found that a tubercular deposit may be produced by feeding them on bad food, and repeatedly plunging them in cold water. The same influences operate on man; for Dr. Baly has shown, that mental depression and confinement cause a remarkable increase in the mortality among the inmates of prisons, and that this is chiefly produced by consumption and scrofula. Such facts show us the importance of hygienic means of treatment; and, viewed in connection with the power of cod-liver oil in promoting the assimilation of the food, they prove to us forcibly the necessity of bringing the digestive organs into as healthy a state as possible, in order to effect the most perfect assimilation of light nutritious articles of diet.

We have already shown, that inflammation and tubercular deposition are allied processes; and the effect of local irritation, in producing pulmonary consumption, is exemplified in the frequency of the disease in persons whose occupations cause them to inhale silicious or metallic particles; and I have no doubt that the fact, noticed by Phillips, of consumption being most prevalent in towns, and scrofula less so, while the reverse occurs in the country, arises, not, as he supposes, from any difference between these diseases, but, in a great measure, from the inhalation of particles of dust and smoke determining the deposition of tubercular matter in the lungs instead of the external parts. In all our efforts to cause the absorption of tubercles, it must, therefore, be a matter of primary importance to prevent irritation, and to remove inflammation or congestion of the lungs by the usual means—local depletion and counter-irritation more especially. The action of all the duperating organs which purify the blood by removing from it the products of the worn-out tissues, should be promoted by the appropriate means; and with the view of preventing catarrhal irritation at the earliest period, I believe that there is no means so effectual as washing the whole surface with tepid or cold salt and water, followed by friction, which excites the duperating function of the skin, fortifies it against the impression of cold, and acts as a general tonic.

The condition of the blood, as ascertained by Andral, and subsequently by Becquerel, and Rodier, furnishes another important indication in the treatment of phthisis, and one which has been found practically useful. In the earliest stage, and perhaps in some cases also before the formation of tubercles, the proportion of globules is below the healthy standard; as the disease progresses, the quantity falls; and in one case, Andral found the proportion as low as 72 parts in 1000 of blood. In this respect, consumption bears a resemblance to chlorosis, and in the diminution of the red globules, we have in the one disease as well as the other, an indication for the employment of chalybeate tonics. I may here observe that, though we have this diminution of the red globules, we are seldom able to discover a loud continuous murmur in the veins of the neck, which is so common a sign in chlorosis. This difference I account for, from there being in chlorosis not simply a diminution of the red globules, but also an increase of the aqueous part of the blood. The veins are thus kept in a state of tension, which is favorable to the production of the venous murmur. In consumption, on the other hand, especially when the disease is in an active state, there is a diminution not merely of the globules, but of the whole quantity of blood in the system, which with the relaxed state of the tissues arising from loss of flesh, prevent the degree of venous tension necessary for the full development of this murmur. When, however, the tubercular disease has become quiescent or has receded, I have sometimes observed the occurrence of a continuous murmur in cases where it had at first been absent; and this I have considered a favorable sign.

There are three ways in which recovery from consumption may take place; first, by the shrivelling of miliary tubercles; secondly, by the transformation of crude yellow tubercles into cretaceous or calcerous concretions; thirdly, by the healing of cavities. We have, now, fourthly, to show that the results of treatment seem to prove that tubercles may be removed by absorption. We cannot, however, have occular proof of this, and hence there has been doubt as to the possibility of the removal of tubercles in this way; but the facts I have still to adduce will tend still further to remove any doubt on this point.

The remedies which, I think, have most claim to our attention as agents capable of promoting changes in tubercular matter, are *mercury*, *iodine*, the *alkalis*, and *cod-liver oil*.

As *mercury* is unquestionably the most powerful remedy we possess, for promoting absorption of the serous and fibrinous exudations of acute inflammation we would naturally expect that it should have some power in causing absorption of tubercular deposits; but it would seem that in proportion as they recede from and lose the characters of plastic organizable fibrin, they are less under the sorbefacient influence of this remedy; and in ordinary cases of consumption, not distinctly produced by acute inflammation, mercury, though occasionally useful as an alterative to promote the biliary and other secretions, is injurious when given so as to act upon the constitution—producing a debilitating effect, and hastening the softening of tubercles.

The preparations of *iodine* have some resemblance to mercury in their effects, but unlike this remedy, they are not of any service in acute disease, but are more useful in causing the absorption of tubercular deposits, especially in glandular structures. The syrup of the iodide of iron is the preparation I have most frequently used, as it combines the absorbent properties of iodine with the tonic power of iron, and thus fulfils the indication in reference to the diminution of the globules of the blood. I regard it as one of the best tonics we can use in the early stages of the disease, and I think that I have seen the early symptoms of phthsis arrested by it in a few cases.

Before the introduction of iodine, the *alkalis* were regarded as remedies of considerable absorbent power. Liquor potassæ is a powerful alterative medicine, and it has sometimes been found to cause absorption of an enlarged gland even after iodine has failed. Dr. Campbell recommended it very strongly in phthsis; and Sir J. Clarke has observed, that the alkalis increase the urinary, and appear to promote the bilious secretion, and to render that of the mucous membranes more fluid; in whatever way they operate, they are certainly beneficial in many tuberculous affections. Their power of promoting absorption of the lymph and other exudation products of inflammation of the lungs or pleura, especially when combined with iodine, is a fact of acknowledged practical value.

Dr. Golding Bird has communicated some most interesting and useful information as to the action of alkaline remedies; he calls them depurating or chemical diuretics, and has shown that, unlike most diuretics, they increase not only the fluid, but also the solid parts of the urine. This they do by a chemical action on the exhausted and worn-out tissues; and he thinks that parts of low vitality, such as tubercle, will be most readily acted on by these chemical agents. It is also worthy of notice, that the caustic alkalis are the most powerful solvents of tubercle; and it is therefore reasonable to suppose that they will retain a portion of that power, when circulating with the blood in the capillaries.

Cod-liver oil has been known as a remedy for consumption and scrofula in Germany and the north of Europe for a considerable period, and Dr. Hughes Bennett has the merit of having brought it into notice in this country. Of the three kinds of oil, the pale, the light brown, and the brown, it has been thought in Germany that the darkest color is the most useful; and this opinion was supported by Dr. Bennett, and is still maintained by Dr. De Jongh. It seems, however, to be now sufficiently well ascertained, that the brown has no superiority over the pale oil. I have seen the best effects speedily produced by the purest specimens of pale oil. Dr. Williams used the pale oil prepared according to Donovan's method; and in the report of the Hospital for Consumption, it is stated that "different qualities of oil, have been tried without exhibiting any marked difference in the remedial effects; but the offensiveness of some of the darker kinds renders their general use impracticable." There are very few cases in which the pale oil cannot be taken; and if we begin with a tea or dessert spoonful and gradually increase it to an ounce thrice a day, on the surface of peppermint-water or milk, there are few persons who do not take it with facility, and become reconciled to it. When it causes nausea, naptha or hydrocyanic acid will usually remove this symptom.

The power of this remedy in controlling the progress of phthisis in a large proportion of cases, and even of arresting its progress in not a few, has now been completely established, and the Hospital for Consumption has even furnished us with statistical facts as to the results of treatment in each stage of the disease.

In Dr. Bennett's work, we are furnished with three cases, fully detailed, of decided consumption, where recovery took place under the use of this remedy. In the appendix to the last edition, he says: "I have succeeded, in several cases, in ascertaining that the caverns have completely healed up, every symptom and physical sign indicating their presence has disappeared, and there has remained only slight dulness or percussion, and increased vocal resonance, as a proof of the puckering and induration of the pulmonary parenchyma attendant on the cicatrix.

[For the strongest evidence in support of the utility of cod-liver oil, Dr. Turnbull refers to the testimony of Dr. Williams, and to the Report of the Brompton Hospital. (See 'Retrospect,' vol. xix, p. 87, and vol. xx, p. 369.) —*Lond. Journ. of Med.*, *Feb.* 1850, *p.* 105.

48.—ON THE TREATMENT OF PHTHISIS.—By Prof. J. H. Bennett, Edinburgh.

I think we are warranted in drawing the conclusion that if, during the advanced period of phthisis pulmonalis, those means can be discovered which check further tubercular exudation, and keep up the strength and nutritive processes of the economy, that such exudations as have occurred will be rendered abortive, and that even large ulcerations will heal up and cicatrize. The important point practically is to ascertain what these means are, and how they may be put into operation.

Now a careful examination of phthisical cases will, I think, show that the great obstacle the practitioner has to contend with are the dyspeptic symptoms which render all his efforts at nourishing the patient in the ordinary way useless. Such individuals have a most capricious appetite, frequently loathe all kinds of animal food, and it will be found that even when they *say* that the appetite is good, and that they live well, the diet actually consumed is either deficient in quantity or quality. Nothing, again, is more common in the progress of such cases than the temporary improvements which follow a change of diet, of locality, or of temperature. How frequently do poor patients, on coming into an hospital, get better merely from enjoying rest and the regular diet of the institution. How often, after a short journey, or on reaching what has been considered a favorable locality, are the friends of consumptive patients in the higher classes rendered happy by the temporary marked improvement which takes place. I consider that such amendments will always be found commensurate to the stimulus given to the nutritive processes of the economy.

An observation of the circumstances which precede the disease, or its so-called causes, clearly indicate imperfect digestion and assimilation as its true origin. Thus phthisis is essentially a disorder of childhood and youth —that is, a period of life when nutrition is directed to building up the tissues of the body. Diminish the the proper quantity of food taken by a healthy man, tubercular diseases are not induced, but if this be attempted with children or young persons, they are a most common result. Thus scrofula and tubercle are not prevalent in armies and fleets whatever privations they may be exposed to; but they abundantly exist in foundling hospitals, factories, and among the young of the poor and laboring classes of the community, and especially among tailors, sempstresses, and others who follow sedentary employments. In the higher classes they result from imperfect and insufficient lactation during infancy, or the irregular diet caused by carelessness or over-indulgence. No doubt they may frequently be observed in persons whose parents or relatives have been similarly affected. From facts of this kind, it has been supposed that hereditary predisposition, a vitiated atmosphere, changeable temperature, certain occupations, humidity, particular localities, absence of light, and so on, predispose to phthisis. Very frequently several of these are found united, so that it is difficult to ascertain the influence of each. When they so separate, however, they invariably produce, in the first place, more or less disorder of the nutritive functions, and are associated with dyspepsia, or other signs of mal-assimilation of food.

From a study of the symptoms, causes, morbid anatomy, and histology of phthisis pulmonalis, we are, therefore, led to the conclusion, that it is a disease of the primary digestion, causing, 1st, impoverishment of the blood;

2d, local exudations into the lung, which present the characters of tubercular exudation; and, 3d, owing to the successive formation and softening of these, and the ulcerations which follow in the pulmonary or other tissues, the destructive results which distiguish it. Further observation shows, that circumstances which remove the mal-assimilation of food frequently check further tubercular exudations, while those which previously existed become abortive, and that occasionally more extensive excavations in the pulmonary tissue may, owing to like circumstances, heal up and cicatrize.

The foregoing considerations render it evident, that the cure of phthisis by art will be proportionate to our power of regulating the nutritive powers in that disease, and controlling those circumstances which induce, 1st, the diseased constitution of the blood; 2d, the local exudation; and 3d, the ulceration of the pulmonary tissue. A discussion of these subjects would lead us into a history of nutrition and exudation, with its results. Referring to the February number of the Monthly Journal for observations on the latter part of the subject, I shall content myself at present with a short resumé of what I have formerly published, as to the nature of the altered nutrition which exists in phthisis pulmonalis, and other tubercular diseases.

A healthy nutrition of the body cannot proceed without a proper admixture of albuminous and oleaginous elements. This may be inferred from the physiological experiments of Tiedemann and Gmelin, Leuret and Lassaigne, Magendie, and others; from an observation of the constituents of milk, the natural food of young mammiferous animals; from a knowledge of the contents of the egg, which constitute the source from which the tissues of oviparous animals are formed before the shell is broken; and from all we know of the principles contained in the food of adult animals. The researches of chemists, such as those of Prout, Liebig, and others, point to the same generalization, when they assert that carbonised and nitrogenised food are necessary to carry on nutrition, inasmuch as oil is a type of the one, and albumen of the other. The chemical theory is imperfect, however, because it does not point out *how* these elements form the tissues; for it is not every form of carbonised or albuminous food that is nutritious, but only such kinds of them as are convertible into oil and albumen.

The reason of this was first pointed out by Dr. Ascherson of Berlin, in 1840, and made known by me to the profession in this country in 1841. I have since endeavoured to show that the elementary molecules formed of a particle of oil, surrounded by a layer of albumen, which are produced, as he described, by rubbing oil and albumen together, are not developed directly into blood-globules and other tissues, as he supposed, but must first pass through a series of transformations, a knowledge of which is highly important, not only to a comprehension of nutrition generally, but especially to that anormal condition of it which occurs in phthisis. Thus the successive changes which occur for the purposes of assimilation in the healthy economy may be shortly enumerated as follows:—1st. Introduction into the stomach and alimentary canal of organic matter. 2d. Its transformation by the process of digestion into albuminous and oily compounds: this process is chemical. 3d. The imbibition of these through the mucous membrane in a fluid state, and their union in the termini of the villi and lacteals to form elementary granules and nuclei; this process is physical. 4th. The transformation of these first into chyle corpuscles, and, secondly, into those of blood, which is a vital process. It is from this fluid, still further elaborated in numerous ways, that the nutritive materials of the tissues are derived; so that it must be evident, if the first steps of the process are improperly performed, the subsequent ones must also be interfered with. Hence we can readily comprehend how an improper quantity or quality of food, by diminishing the number of the elementary nutritive molecules, must impede nutrition.

The peculiarity of phthisis, however, is, that an excess of acidity exists in the alimentary canal, whereby the albuminous constituents of the food are rendered easily soluble, whilst the alkaline secretions of the saliva and of the pancreatic juice, are more than neutralized, and rendered incapable either of transforming the carbonaceous constituents of vegetable food into oil, or of so preparing fatty matters introduced into the system, as will render them easily assimilable. In consequence, more albuminous than fatty matters enter the blood, and the necessary waste of structure is supplied by the absorption of the adipose tissues of the body. Hence the emaciation which characterizes the disease. In the meanwhile, the lungs not having so much carbon to excrete in the form of carbonic acid, become especially liable to local congestions, leading to exudation of an albuminous kind, which is tubercle. This, in its turn, being deficient in the necessary proportion of fatty matter, elementary molecules are not formed so as to constitute nuclei capable of further development into cells,—they therefore remain abortive, and constitue tubercle corpuscles. Thus the local disease is added to the constitutional disorder, and that compound affection is induced, which we call phthisis pulmonalis—consisting of symptoms attributable partly to the alimentary canal, and partly to the pulmonary organs.

To improve the faulty nutrition which originates and keeps up the disease, it is of all things important, therefore, to cause a larger quantity of fatty matter to be assimilated. A mere increase in the amount, or even quality of food, will often accomplish this. The treatment practised, some years ago, by Dr. Stewart, of Erskine, which consisted in freely administering beef-steaks and porter, and causing exercise to be taken in the open air, excited considerable attention from its success. I have been informed, that in some parts of America the cure consists in living on the bone marrow of the buffalo, and that the consumptive patient gets so strong in this way, that he is at length able to hunt down the animal on the prairies. All kinds of food rich in fat will not unfrequently produce the same effects, and hence the value long attributed to milk, especially ass' milk—the produce of the dairy, as cream and butter, fat bacon, caviar, &c.

But, in order that such substances should be digested and assimilated, the powers of the stomach and alimentary canal must not have undergone any great diminution. In most cases it will be found that the patient is unable to tolerate such kind of food, and that it either lies undigested in the stomach, or is sooner or later vomited. Under these circumstances, the animal oils themselves are directly indicated, by giving which we save the digestive apparatus, as it were, the trouble of manufacturing or separating them from the food. By giving considerable quantities of oil directly, a large proportion of it is at once assimilated, and is rendered capable of entering into combination with the albumen, and thereby forming those elementary molecules so necessary for the formation of a healthy chyle. Such, it appears to me, is the rationale of the good effects of cod-liver oil.

Since I introduced this substance to the notice of the profession as a remedy for phthisis, in 1841, I have continually prescribed it in hospital, dispensary, and private practice. I need not, perhaps, say, that I have given it in a very large number of cases, and have observed its effects in all the stages of the disease, and under almost every circumstance of age, sex, and condition. I have had the most extensive opportunities of examining the bodies of those who have died after taking it in considerable quantities, and am still observing the cases of many persons who may be said to have owed their lives to its employment. Further, I have carefully watched the progress it has made in the good opinion of the professional public, and perused all that has been published regarding it in the literature of this and other countries. It were certainly easy for me therefore to write at great length on this subject; but I do not see that anything of utility could be added to what I have already published. The following is a summary of my views regarding cod-liver oil, as a remedy for phthisis:—

1. Cod-liver oil is, as M. Taufflied pointed out, an *analeptic*, and is indi-

cated in all cases of anormal nutrition dependent on want of assimilation of fatty matter.

2. It is readily digestible under circumstances where no other kind of animal food can be taken in sufficient quantity to furnish the tissues with a proper amount of fatty material.

3. It operates by combining with the excess of albuminous constituents of the chyme, and forming in the villi and terminal lacteals those elementary molecules of which the chyle is originally composed.

4. Its effects in phthisis are to nourish the body, which increases in bulk and in vigour; to check fresh exudations of tubercular matter, and to diminish the cough, expectoration, and perspiration.

5. The common dose for an adult is a table-spoonful three times a day, which may often be increased to four, or even six, with advantage. When the stomach is irritable, however, the dose to commence with, should be a tea or dessert-spoonful.

6. The kind of oil is of little importance therapeutically. The pure kinds are most agreeable to the palate; but the brown coarser kinds have long been used with advantage, and may still be employed with confidence whenever cheapness is an object.

7. I have never observed its employment to induce pneumonia—as it has been lately supposed to do by Dr. Benson. On the other hand, nothing is more common than to find after death more or less peunomic condensation around tubercles.

8. Neither have I ever been able to trace fatty liver or kidney to its use, however long continued, although such complications of phthisis are also exceedingly frequent.

[Dr. Bennett relates a number of cases which he considers to be *cures* of phthisis, effected by treatment conducted according to the foregoing considerations. He cautions us, however, against the idea that cod-liver oil is alone sufficient to cure phthisis, or that other means and precautions may be neglected with impunity. He observes:]

In the early stages its management is not so difficult, and is comparatively much more successful; not, indeed, that even then it is always easy to overcome the dyspepsia and other causes which tend to produce and keep up the disorder. I have pointed out, in another place,* that when the stomach is deranged, it often requires a variety of remedies, to counteract its irritability and acidity, before nutritive substances can be taken. In other instances, however, especially when it exists in the half-starved poor, the food is taken readily, and then amendment is generally soon observed. Again, although cod-liver oil may for a time be digested, it not unfrequently after a time causes nausea, and cannot be tolerated, and under such circumstances chalybeates, with tonics, constitute valuable auxiliaries.

The complications and occasional symptoms which occur in this disease, present a wide field for the judicious interference of the physician, who will achieve more by saving his patient from unnecessary drugs, and giving nature fair play, than by what is called "doing something." For instance, I have never been able to satisfy myself of the advantage of giving mineral acids to check the perspirations. In such cases the stomach is generally already too acid; the albuminous matters are easily digested, whilst the oily principles are not. Surely acids will not improve this condition, but rather alkalies, as recommended by Dr. Campbell, which I have always found very useful in certain states of the digestive process. If the recent researches of Bernard on the functions of the pancreas be attended to, it would appear that the secretion of that organ is alkaline, and necessary for the assimilation of fatty matters. It is very possible that the peculiar dyspepsia of phthisical cases is connected with a deficient secretion of the pancreatic juice. But not to enter upon speculations of this kind, I regard it as an undoubted fact, that the perspirations in phthisis are only evidences of the weakness of the individual. Restore his appetite and power of digestion, increase his strength, and the sweatings disappear. This is not to be done by giving sulphuric or nitric acid, but by cod-liver oil, and a wholesome diet.—*Month. Journal*, *March and May*, 1850, *pp.* 234 and 401.

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* Lectures on Clinical Medicine, Part I., p. 43.

49.—ON THE INFLUENCE OF MORAL CAUSES IN THE PRODUCTION AND IN THE TREATMENT OF PHTHISIS.—By Dr. J. F. DUNCAN, Physician to Sir P. Dun's Hospital, Dublin.

[Dr. Duncan appeals to the ordinary experience of the profession, whether pulmonary consumption does not usually occur "in persons whose temperament is peculiarly liable to be affected by moral impressions." He thinks that this fact will, to a great extent, explain the prevalence of the disease among particular classes of persons, and at particular times of life; observing, with respect to the latter,]

There appears to be three periods at which the mortality of phthisis exhibits a maximum intensity. First, that immediately succeeding birth; secondly, that which commences at the epoch of puberty; and, lastly, that which corresponds to the decline of mature life. The first takes place at a period when moral causes can have no influence either in exciting or aggravating the liability; it is hence due to the force of constitutional predisposition almost exclusively. The other two are the result, in part at least, of moral causes, which act at these periods of life with more than usual intensity.

[Dr. Duncan endeavors to elucidate the action of the emotions in the causation, and the treatment of prophylaxis of the malady, in the following manner:]

Simon, in his 'Animal Chemistry,' vol ii. p. 479, states the formula for crude pulmonary tubercle to be $C^{43} H^{35} N^{5} O^{13}$, while that for the protein is $C^{48} H^{36} N^{6} O^{14}$; in other words, tubercle consists of an imperfect protein, differing from it in the absence of five atoms of carbon, one of hydrogen, and one of oxygen. Protein is the starting point of all the tissues, and the primary compound principle of fibrine, albumen, and casein. It is, of course, the natural result of the process of digestion, when healthily performed. When this process, from any cause, is interfered with, the proper combination of the organic atoms does not take place, and a less soluble product is formed than what the necessities of the system require. Now it is easy to see that the depressing passions must, to a very considerable extent, operate in this way. All the secretions are under the influence of the emotions to a remarkable degree. Intense sorrow suspends the secretion of the gastric juice. Sudden fright stimulates the kidneys to unwonted activity. Anger arrests the action of the liver. Even the tears do not flow when grief is very violent. Is it at all surprising that a slighter degree of these emotions, acting slowly, but not less certainly, should interfere with some of the deeper processes of digestion, or prevent the full development of a healthy fluid?

Exhilirating impressions, on the contrary, have an opposite effect, causing these processes to take place with greater rapidity and force, and so purifying the system of every stagnant element that might accumulate and become prejudicial. Even ordinary occupation must have some effect in this way, by imparting tone to the various organs immediately concerned, and by permitting them to pursue quietly and without disturbance their proper functions.*

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*It is scarcely necessary to remind the reader that the opinion here advocated is strictly in accordance with what has been already published by Sir James Clarke, under the head of tuberculous cachexy, and by Dr. Todd under that of strumous dyspepsia, as occurring antecedently to the actual development of tubercle, and preparing the way for it.

The practical utility of this view of the subject consists, first, in directing us to proper modes of managing those individuals who are born with an hereditary tendency to the complaint, but in whom the constitutional bias is not so great as to prove immediately destructive to life. In all such cases I believe it to be of the utmost importance in addition to proper hygienic treatment, to have the mind profitably employed in some manner suitable to the tastes and capacity of the individual. I do not, of course, mean to say that the powers are to be overtasked by protracted occupation, and without corresponding relaxation. Such persons are not formed for great exertion, either mental or corporeal. But it is one thing to give them employment sufficient to occupy and exercise their faculties, and it is another to impose upon them a burden to which they are unequal. Cheerful society should, in all cases, be provided for them. In determining the nature of the employment, much must be left to the judgment of the medical man, and still more to the individual. Mere amusement, however it may please for the moment, will not answer for a continuance; it palls in the enjoyment, and the mind necessarily pants after that active and industrious exertion of its faculties which is the original condition of its existence.

The same holds equally true at a later period, when, the disease having developed itself by unequivocal signs, a change of climate comes to be considered, with the view of arresting its progress. I believe that far too much attention has been bestowed upon the mere atmospheric conditions involved in this measure, and far too little on the accidental circumstances associated with it. Every one must admit, that after all the study which has been bestowed upon the subject of climate, very little information of a satisfactory natute has been obtained. We find some writers recommending a moist climate for the invalid, some a dry one, some a moderately warm, and others a moderately cold one; while in almost all these places, if accurate information could be had, the frequency of the disease would, probably, be found to differ very little from what exists at home. I am very far from wishing to discourage a change of climate in the early stages of consumption; I believe that it is often attended with striking and decided benefit, but I am anxious to call attention to the *adjuvantia* and *lædentia* inseparable from it. Among the former may very frequently be enumerated, removal from unpleasant circumstances, or the want of suitable society at home; the excitement of visiting foreign countries, with their peculiar manners and habits; new associations formed on the journey; and the opportunities of mental improvement in various ways. On the other hand, it must not be forgotten there are drawbacks in the separation of the individual from his family and friends; the inconvenience arising from the want of many comforts to which he may have been accustomed; the accidental circumstance of his meeting with companions of a congenial disposition with his own; the absence of all taste for the attractions which the countries visited may present: these, and many other circumstances, contribute materially to counteract all the advantages that the best-selected climate can possibly afford.

I knew one young gentleman brought up to mercantile business, and destitute of those resources within himself which spring from a liberal education, who went abroad for change of air when laboring under consumption. Though most amiable in disposition, he was little else than a walking vegetable; he took no pleasure in reading or the improvement of his mind. Even the passing topics of the day seemed to have no attraction for him. All his enjoyments seemed to be centred in his family. Fortunately for him, his mothers and sisters were able to accompany him, as otherwise I have very little doubt that the fatal issue would have been accelerated rather than retarded by the removal.

The following cases illustrate the opposite view of this question. They are those of two brothers, whose mother died of the complaint. The elder I did not see previously to his departure for Italy, but I have little doubt, from the medical treatment abroad, that he really labored under the disease. He was a young man of cultivated mind, of an ardent temperament, and considerable ability. During his residence on the continent, he occupied himself, not only in seeing the lions of the several places he visited, as tourists usually do, but he took sketches of the scenery, and copied the details of many of the models of architecture for which the Roman capital is so celebrated; a circumstance that has proved of immense advantage to him in the profession of an engineer, which he has adopted since his return. Of his brother I can speak more decidedly. In addition to the predisposition which he inherited from his mother, evidenced in his thin figure, clear blue eyes, and great height in proportion to his age, he had distinct physical evidences of the formation and softening of tubercular matter at the apex of his right lung. This I had ascertained at midsummer, a few years ago, as he was preparing to enter the university. At my suggestion, his studies were abandoned, and the family removed to the county Wicklow, where, in addition to the mildness of the air, he enjoyed the opportunity of boating on the sea in company with some young persons of his own age. All this had a most marked and beneficial effect upon his system, and though he retained many symptoms of delicacy, all the signs of tubercular excavation disappeared. In the autumn of that year his brothers got an engagement as engineers to a projected railway in Spain, and they proposed to him to accompany them, and they would give him employment. The offer was cordially accepted; he entered with alacrity into the duties of his new office, and was soon able to endure a degree of fatigue which he could not previously have attempted; and even to wade through rivers without changing his clothes, and without the slightest subsequent ill effect. He has since then returned to this country in perfect health, and has remained well ever since. I am aware that it may be said the beneficial results experienced in his case was due to the change of climate solely, and not to the mere circumstance of his having procured congenial employment; but from inquiries that I have made from him, I have reason to believe that Spain, especially that part of it where he was stationed, is anything but favorable to the consumptive invalid; the natives frequently fall victims to the disease; and the weather is exceedingly trying to a delicate constitution.—*Dublin Quart. Journal, Feb.* 1850, *p.* 22.

50.—ON GANGRENE OF THE LUNG.—By Dr. W. Stokes, Regius Prof. of Physic in the University of Dublin.

At the terminatien of a paper upon this subject, Dr. Stokes draws the following conclusions:—

1. That gangrene of the lung is met with under a variety of forms, differing from one another not only in the duration and violence of the symptoms, but also in their relations to various local and constitutional diseases.

2. That in a great proportion of the cases the disease is attended with putrefactive action engaging the necrosed portion of the lung, and affecting its secretions.

3. That in the progress of a case, we may observe the septic action singularly variable. It is increased by over-stimulation of the system.

4. That we cannot explain the symptoms in many cases of this disease, without assuming either that a spot of mortification, so small as to be undiscoverable by physical means, causes severe symptoms, and is attended with super-secretion; or that a process of putrefactive secretion precedes, in many cases, the death of the lung.

5. That pain of the most extreme kind may attend this disease; and in the remittent form, appear on each access of the affection with unmitigated violence.

6. That contact with the air is not necessary for the formation of a gangrenous eschar or cavity.

7. That hemoptysis commonly attends each access of the remittent disease.

8. That in the earlier periods of this disease, auscultation and percussion often fail in detecting any signs of organic change: or if such is discovered it appears incommensurate with the gravity of the symptoms.

9. That in many cases the evidences of congestion and parenchymatous infiltration, seem to follow, rather than precede the symptoms of gangrene.

10. That dexiocardia, from diminished volume of the lung, may occur in gangrene of the right lung.

11. That gangrene may attack a lung previously hepatized from ordinary inflammation, or in a chronic tubercular condition.

12. That from the pre-existence of signs and symptoms of the stages of pneumonia, or from the early appearance of signs of excavation, we may be able to distinguish between fetid abcess of the lung and gangrene.

13. That in certain cases of chronic bronchitis the breath and expectoration may become fetid, and yet no gangrene appear to have formed.

14. That the diseases with which gangrene may be found complicated are divisible into general and local affections; but that its occurrence in the class of general diseases, termed putrid or asthenic, is much more rare than might be expected.

15. That it is rarely observed in the typhus fever of this country, even where the secondary bronchial affection is intense; but that in typhoid pneumonia it may be occasionally observed.

16. That it may complicate a previously existing disease of the lung, such as pulmonary tubercle, or an unresolved hepatization.

17. That it may be directly induced by the pressure of a tumour on the nutrient vessels and nerves of the lung, so that in cases of cancerous or aneurismal tumour, the patient may die, not from the extension of the original disease, but from its inducing a rapid mortification of some portion of the lung.

18. That the disease, though always of a formidable character, is not necessarily fatal.—*Dub. Quart. Journal, Feb.* 1850, *p.* 20.

51.—CASE OF MALIGNANT ULCERATION OF THE LARYNX.—By R. H. MEADE, Esq., Bradford.

[Mr. Meade's patient was a married lady, fifty-four years of age. The earliest and most prominent symptom in the case was spasmodic difficulty in swallowing, which led Mr. Meade to suspect disease of the œsophagus as the primary affection. No obstruction, however, was felt on the introduction of a bougie. There was also very great pain, deeply seated in the neck, about the level of the cricoid cartilage. Leeching, blistering and alterative medicines were employed; but the difficulty of deglutition increased, so that for some time before the patient's death, she was quite unable to swallow at all. A few weeks before death a tumour, hard, unyielding, and painful on pressure, appeared on the left side of the neck beneath the sterno-mastoid muscle; and then a similar, but smaller one, appeared in the same situation on the right side. Mr. Meade thus relates the *post mortem* appearances:]

The body was examined forty-eight hours after death.—The integuments having been carefully reflected from the front of the neck, the trachea and œsophagus, with the pharynx and tongue, together with the muscles, vessels, &c., connected with them, were separated from their attachments to the base of the jaw and skull, and the front of the spine, and turned downwards, so that the examination might be made from behind. On opening the back of the pharynx and œsophagus, no serious disease was found in these organs. The mucous membrane of the pharynx and back of the tongue was, granular, and unhealthy looking, but not thickened or ulcerated. The œsophagus was rather narrower than usual, but there was no thickening nor induration of its coats. The fatal disease was confined to the larynx, which was extensively ulcerated. A foul, blackish-looking ulcer had completely destroyed the left side of the upper part of the larynx, down to the level of the rima glottidis. The epiglottis was thickened, but not otherwise much altered. The upper part of the left ala of the thyroid cartilage, and its ascending cornu, were completely eaten away with the membranes and ligaments attached to them. The extremity of the greater cornu of the os hyoides was also carious, and partly gone. The true chordæ vocales were entire, but appeared thickened, and the whole mucous membrane of the larynx was granular and unhealthy. There was no disposition of new matter forming any malignant tumour in connexion with either the trachea or œsophagus (as was previously expected), and the tumours, developed toward the close of life on the sides and front of the neck, were quite distinct from the disease in the throat and larynx. The structure of these tumours was rather peculiar: on reflecting the sterno-mastoid muscle from the front of the tumour on the left side, fluctuation was perceived, and on cutting into the swelling, a small quantity of limpid serum escaped from a cyst in its interior. On continuing the dissection, and examing the tumour carefully, it was found to consist of a fibrous substance, of a very firm consistence, which was full of irregular cells or cavities, communicating with each other; and filled with serous fluid. The divisions between the different cells were cribriform, and hard fibrous bands or cords traversed them in various directions. The tumour seemed to have been formed within the sheath of the great vessels. The descendens noni nerve was traced over its surface, but without being involved in its substance. The internal jugular vein, on the contrary, was completely obliterated for two inches of its course, being converted into a solid fibrous cord. The carotid artery and pneumogastic nerve were unaffected, though the former was closely attached to the tumour. The disease extended from about the middle of the neck quite up to the base of the skull.

The smaller tumour on the right side had exactly the same structure; it was also connected with the sheath of the vessels, but the vein was not obstructed. No disease was found in the lungs.

Remarks.—Throughout the whole course of the above case I laboured under an error in diagnosis, thinking that the original and principal seat of the disease was in the œsophagus, and that the larynx was only secondarily affected. The causes which led to this error were, the history of the case, the early symptoms, and the development of the tumours in the sides of the neck towards the end of life. The patient had been subject for many years before she consulted me to spasmodic stricture of the œsophagus, and constant slight difficulty of swallowing; and when I first saw her the pain she complained of was only felt in deglutition. She had then no cough nor difficulty of breathing, nor had she ever been subject to either. I therefore considered that the spasmodic affection had gradually produced thickening of the coats and contraction of the canal of the œsophagus, which disease had ultimately assumed a cancerous form: ulceration had then taken place, which had extended to the larynx and trachea. explaining the symptoms of disease of those organs which subsequently arose; and new matter was deposited round the diseased part, which gradually involved all the surrounding tissues, and towards the termination of the case made its way towards the sides of the neck in the form of hard tumours.

I find other cases related in which disease of the larynx has been mistaken for stricture of the œsophagus. Abercrombie says—"I have seen several cases [of disease of the larynx] in which the dysphagia was the prominent symptom, so as to lead to the supposition of disease of the œsophagus rather than of the trachea. In one of these cases the patient had no constant difficulty of swallowing, but was liable to sudden attacks of it during his meals, which threatened instant suffocation. In another case the dysphagia was permanent, and was combined with a hoarse husky cough and slight dyspnœa. The whole body of the larynx was much enlarged and thickened; and it was in some degree ulcerated both internally and towards the œsophagus. In both cases the œsophagus was entirely healthy."

As the disease of the larynx gave rise to all the later symptoms in the progress of the disease, it had probably been also the exciting cause of the spasmodic affection of the œsophagus to which the patient had been so long subject; and in that case must have existed (though in a slight form) for many years. In his 'Outlines of Human Pathology,' under diseases of the œsophagus, Mr. Mayo relates an interesting case of spasmodic difficulty of deglutition, which depended upon the irritation caused by ulceration of the interior of the larynx. For the details of this case I must refer to the work itself, not having it at hand.

The next point of interest in this case is the nature of the affection of the larynx. The existence of chronic ulceration in this part has been denied by some authors except in connection with either phthisis or syphilis, but others admit cancerous ulceration of the larynx as a primary affection, though such a disease is certainly rare. No tubercles were detected in the lungs in this case, and no suspicion of a syphilitic taint could be entertained; therefore the ulceration of the larynx must be considered an idiopathic affection, and of a malignant or cancerous nature. No new matter was formed around, or in the diseased textures, as occurs in most forms of cancerous disease in mucous membrane, as, for instance, in cancer of the œsophagus or rectum; but cancer is described as sometimes commencing in mucous membranes by simple hardening, which runs into ulceration. All forms of cancerous disease are remarkable for their tendency to produce secondary affections in other parts; and this leads us to the last point of interest in the case—viz. the nature of the tumours in the neck, and their connection with the disease in the larynx. As I have before stated, no direct communication existed between them. Could they be considered of a cancerous nature? I can find no cases recorded exactly of a similar character, but Muller's description of the form of carcinoma which he calls alveolar bears some resemblance to them. It consists of a tissue of firm white fibres and plates crossing each other in various directions, between which cells are found, from the size of grains of sand to that of large peas, which frequently communicate with each other, and all contain a very viscid pale and transparent jelly. The cells in the tumours I have described were much larger than those said to be met with in the alveolar cancer of Muller, and the fluid contained in them was limpid and apparently serous; still, from the rapidity of their development, and their connection with malignant ulceration, they must also, I think, be considered of a malignant nature. In the 'Surgical Anatomy of the Head and Neck,' Allan Burns describes a peculiar sacculated tumor which is sometimes met with in the side of the neck, which has some resemblance in structure to those in question, but it seems to be non-malignant, and connected with the parotid gland. He says—"Sometimes the lower lobe of the parotid gland becomes sacculated, forming a collection of watery viscid fluid. Such a tumor begins just behind the angle of the jaw, and from that nucleus proceeds downwards and laterally. As the swelling is covered by the fascia it is consequently tense; and although the sides of the cyst be thin and pliant, fluctuation is obscure. This species of tumor does not require to be extirpated, its nature, so long as it is sacculated, is simple; it is a mere body of saliva hollowed out in the glandular substance.—*Med. Gazette, Jan.* 4, 1850, *p.* 8.

52.—ON THE TREATMENT OF CROUP BY CALOMEL AND ALUM.—By. M. MIGUEL.

In a letter addressed to the Medical Society of Inde-et-Loire, M. Miguel of Torres, has given some important details of the result of the method of treatment which he employs in diphtheritis.

He relates that, about twelve years ago, a little girl, 7 years old, having been simultaneouly seized with angina and croup, he proposed to perform the operation of tracheotomy, which was objected to by the parents. Being thus deprived of the last resource of art, he alternately administered to the child, every hour, two grains of calomel and three grains of alum. This treatment was continued a week, and produced no purgation nor salivation. Since this case, M. Miguel has treated twenty-six cases of croup, only three or four of which were doubtful; and only five cases have been fatal. He attributes the efficacy of his method to the mercury; but as it is liable to produce salivation and other disastrous consequences, these must be prevented; and M. Miguel thinks he has attained this object by combining alum with calomel. He thinks that when the calomel and alum are alternated, the latter serves to circumscribe the mercurial action, which should also be well watched, so that the administration of calomel may be suspended on the least appearance of mercurial intoxication.

Remarks. The treatment of M. Miguel is founded on the property which is attributed to mercury, of diminishing the plasticity of the blood, and opposing the formation of false membranes. The important point is, that this treatment has proved successful in a certain number of cases. It should be known, also, that such treatment will not supersede the necessity of emetics and of energetic cauterization, when the disease has commenced in the pharynx. In such cases, mercury alone is useless: it may be prescribed, but the local treatment is that which must be chiefly depended on, to arrest the progress of the disease. Of this we saw a remarkable instance, a short time ago, in the practice of M. Trousseau.

In this case, the diphtheritis had commenced in the tonsils, and had extended towards the larynx. On the first day of its appearance, an emetic of sulphate of copper was administered, and the back of the throat was well cauterized with fuming hydrochloric acid. This cauterization was repeated once on the nex day, twice on the day following, and once on the subsequent day. At the same time, the patient took, in small quantities every quarter or half an hour, a mixture of ten grammes of alum with the same quantity of honey. This is preferable to alum in powder, because the medicine comes into permanent contact with the throat and the arytæno-epiglottic cartilages.

In prescribing alum, M. Trousseau used it as an auxiliary to cauterization, not as a corrective to mercury, which he did not give during the whole progress of the case. From the third day, there was a steady improvement; and, on the sixth, the cough had lost its croupy character. The voice continued rather weak, which showed the existence of false membranes on some points. Cauterization was continued once a day, for two days, together with the alum and honey: and the child recovered. This method of treatment is considered, by M. Trousseau, to be the most certain which can be employed in cases of croup.—(*Journal de Med.*)—*London Journal*, *Feb.* 1850, *p.* 186.

53.—ON THE TREATMENT OF HOOPING-COUGH BY THE APPLICATION OF NITRATE OF SILVER TO THE INTERIOR OF THE LARYNX.—By Dr. E. WATSON, A.M., Glasgow.

[The unsatisfactory and empirical nature of all the modes of treatment hitherto proposed for hooping-cough, is well known, and depends upon our imperfect knowledge of the essential pathology of the disease. One theory makes bronchial inflammation the first link in the chain of causation; while according to another, the bronchial affection is itself preceded by inflammation of the brain and its membranes. According to some, the essential element of the disease is irritation of the pneumogastric and phrenic nerves; while others, and amongst them the writer of the following paper, states that there is in the first instance inflammation of the respiratory surfaces, followed by irritability of the glottis. In reference to this, Dr. Watson, says:]

This last mentioned theory is substantially the one which I adopt, as being simplest, and nearest to the truth. I believe, that in a case of uncomplicated hooping-cough the morbid poison first inflames the mucous membrane lining the pharynx and upper part of the larynx; that there the extreme branches of the sensory nerve, the superior laryngeal, become affected in some peculiar way, which I shall not attempt to explain; and that finally the motor nerve, the recurrent laryngeal, is excited into reflex action. Hence the ordinary progress of the symptoms, which first resemble those of a common cold, or slight bronchitis—differing, however from the latter in the absence of any constitutional or stethoscopic indications of inflamed bronchi, as well as in the periodic character of the cough. Along with this symptom may also be be ranked certain peculiar pains of the throat and neck, which are often complained of and seem to indicate the effect of the poison on the sensory nerves of these parts. Then follows the distinctive symtom of the affection—viz., the hoop or drawback—which is produced by the excitement of the inferior laryngeal nerve, and consequent spasm of the muscles of the glottis. Such are the symptoms which, in my opinion, are alone essential to the hooping-cough. Few cases of that disease, however, proceed far on their course without the occurrence of another symptom—viz., vomiting—during or towards the end of the paroxysms of coughing; which is doubtless caused by an extension of the morbid influence to the branches of the pneumogastric suppying the stomach.

Viewing the hooping-cough, then, as essentially an inflammation of the pharyngo-laryngal mucous membrane, with a peculiar nervous irritability of the glottis, I was naturally led to the opinion, that, if I could reduce either or both of these states, I should mitigate or even cure the disease; and I shall now, in a few words, explain the way by which I came to try, for that purpose, the topical application which I a am about to recommend.

Soon after the publication of Dr. Horace Green's work on 'Diseases of the Air-passages', I had several opportunities of putting to the test of experience his method of treating chronic laryngeal affections, viz., by touching the lining of the larynx with a solution of nitrate of silver. My trials fully confirmed his statement of the efficacy of the treatment referred to; and I soon found that I could with advantage carry out a similar practice in many other diseases, such as in ordinary acute bronchitis, in the intervals of asthma, and even with relief of the tickling cough in early phthisis. Having thus established to my satisfaction the efficacy of a topical application of caustic solution, in cases, not only of chronic disease of the larynx, but in all cases of inflammatory irritation of the glottis, I came to the conclusion that it might operate beneficially in the hooping-cough; and, after a pretty extensive trial, I have not been disappointed.

The first case, in which I attempted it, was that of the weakly boy, about eight years old, in whom the disease was already at its height. He had a severe paroxysm of coughing regularly every quarter of an hour; he was already much debilitated, and in constant danger of having some serious lesion produced in his delicate lungs. From the first time that I applied the solution to the glottis, the severity of the cough was mitigated, and after repeating the application every second day for about a week, he was found not to hoop at all. The boy then made a speedy and complete recovery of his ordinary strength under the use of the cod-liver oil.

The sister of this paitent was also seriously affected by the same disease, and the application of a solution of caustic was likewise used in her case. But its effects were not so striking as in the other case, owing to the presence of lobular pneumonia of the posterior part of the left lung. Nevertheless, the paroxysms of the hooping-cough diminished in frequency and in violence under its use; and after the pneumonia had been subdued by pretty active measures, the child ultimately made a good recovery.

My third case was that of a boy, about six years of age, in whom the disease had nearly passed without much treatment of any kind having been employed; but he still was harassed with frequent and pretty violent fits of coughing; and when excited or frightened, he still had that mode of drawing in his breath, popularly known as "the drawback." Two or three applications of the solution to the glottis and larynx of this child were sufficient to accomplish a perfect cure of his symptoms; and a short sojourn in the country, with the use of a tonic, completed his restoration to health and vigour.

I have since treated, in a similar manner, several other cases of hooping-cough. The results are equally favourable with those arleady mentioned. None of my patients continued to hoop more than eight or ten days after the solution of caustic began to be applied to the glottis; and from the first of such applications, the mitigation of the symptoms was very marked. In some cases of children living in the same house with patients affected with hooping-cough, and who exhibited symptoms of the commencement of that disease, such as frequent fits of coughing, especially during the night, and when suddenly agitated, with absence of co-existing fever, and of the physical signs of bronchitis, &c., I have, by applying the solution of caustic to their larynges, succeeded in dissipating the symptoms alluded to, and restoring the children to health. I should be sorry to say positively that these symptoms, in all the cases referred to, would, if let alone, have issued in true hooping-cough; but it seems to me *probable* that in most of them they would; and it is certain that they existed in children who had not previously had hooping-cough, who were at the time exposed to its undoubted infection, and in whom the disease die not become formed. I am myself inclined to think that in these cases the disease was checked; but I can hardly expect that the reasoning, by which I have been led to this opinion, can be equally conclusive to others who have not had opportunities of judging of the instances referred to.

I have met with several cases, and have already given an example, in which the violence of the disease had been got over with the ordinary treatment, but the cough still continued. Such children are usually of nervous temperament, and in bad general health, and whenever they cry, a modified hoop is still heard. In all these cases the topical treatment is remarkably efficacious, as well as speedy in its action, a few applications of the solution sufficing, in most instances, to effect a cure.

While thus stating my confidence in the topical plan of treating the hooping-cough, I ought to mention, that I invariably combine with it due attention to the patient's diet, and proper regulation of the functions of the alimentary canal. I also confine my patients strictly to one apartment, suitably heated and well ventilated, until the stage of hooping has been fairly overcome; and then, if necessary, I recommend change of air and the use of some tonic, generally the cod liver oil. By pursuing such a mode of treatment, this disease, instead of extending with severity for from two to six months, need not last longer than as many weeks, and with no greater severity that that of a common catarrh.

The ordinary strength of the solution which I have used in the treatment of the hooping-cough, is gr. xv. of the nitrate of silver to an ounce of distilled water; but in some cases I have with advantage increased it to ℈ij. of the salt in the ounce of water. It shauld be applied every second day; at first to the pharynx only, as soon as the parts will bear it, to the glottis and interior of the larynx. In most children the sponge may be passed down to the glottis at the first application, and, at all events, this procedure need not be delayed beyond the next occasion.

The mode of making this application is sufficiently simple. With a bit of sponge sewed firmly on the end of a whalebone rod, shaped nearly like a male catheter, the operation may, in most cases, be performed with the greatest ease. The patient's head being steadied by an assistant, the tongue is held down by a teaspoon, and the sponge made to glide, on the surface of the epiglottis, down into, and through, the rima glottidis. A very slight and temporary sense of suffocation follows, and the child very soon forgets that anything has been done. The whalebone should be pretty strong, for it is apt to bend in the mouth, and, perhaps, from the tossing of the child, to pass into the œsophagus instead of into the larynx. It is right also to mention, that sometimes a slight amount of pressure is required on the glottis ere the sponge is allowed to pass down. This obviously happens from the valves closing, as in the act of swallowing, before the operator has interposed his sponge, and prevented their coming in contact. The difficulty generally occurs in those cases in which the glottis is placed unusually low in the larynx, and when this is known to be so, the tongue should be pulled well forward, and an opportunity being watched for, when he patient coughs or draws in his breath, by a quick movement of the operator's hand the sponge should be suddenly passed into the larynx.

By thus taking the parts by surprise, he will often accomplish his purpose with ease; though sometimes he will still find the glottis shut against him, and in these cases a little gentle pressure will generally overcome the obstacle. It does require some tact and experience to know what degree of pressure the glottis will bear without injury; but that it will bear a certain amount of pressure with impunity, every one is aware who has tried to any extent this method of treating laryngeal disease. I must remark, however, that I have not found this practice of gentle pressure on the glottis by any means so frequently required in children as in adults. The former generally become frightened, gasp, and cry freely, so that, in them, the aperture is found fully open, and the operator may easily and safely pass his sponge into the larynx.

Some indeed, not questioning the possibility of applying such solutions to the the glottis and larynx, may deny the propriety of their use in the case-of organs so irritable, and at the very time in a state, if not of acute inflammation, at least one bordering very closely upon it. But every one admits the advantage of using similar solutions to a no less delicate organ, the eye, when affected with the most acute inflammation; and the results of a few trials will convince any one, that, in irritable and inflammatory states of the larynx, a similar treatment may be pursued with equal safety and success.

[Dr. Hislop, of Govan, has also used this plan of treatment with success. In a letter to Dr. Watson he says:

The first case in which I have tried the nitrate of silver to the larynx, was a very chronic one, and well calculated to test its efficacy;—A child, three years of age, seized early in the present year with pertussis, and at this time, after a lapse of five months, still liable to a return of the cough on making the least exertion, or receiving any excitement. I continued the application of the solution (ten grains to the half ounce of water) for a succession of mornings,—at first to the back of the throat, but gradually wearing downwards to the glottis, until I managed, I believe, ultimately to completely insert the sponge. The cough gradually diminished in frequency, and *is now entirely removed.*

In the second case, the patient had only been five weeks affected by the disease, was four years of age, robust, and with considerable mucous râles in the bronchi of both sides. The solution was applied *four times.* A vast diminution in the returns of the cough and the length of the back-draught took place, and the patient *is now rapidly getting quit* of the disease.

In the remaining cases, the improvement that has followed the application of the caustic solution has been equally marked, particularly the diminishing the frequency, severity, and duration of the drawback; and in one of the cases, where the solution was more perseveringly applied, a *complete cure* has been *speedily* effected.

In regard to the difficulties that have been foreshadowed in the way of *applying* the remedy, I conceive they have been much exaggerated, and that it will not be found more difficult than any similar operation on the neighbouring parts.—*Monthly Journal of Medicine, Dec.* 1849, *p.* 1287.

54.—ON THE USE OF BELLADONNA IN HOOPING-COUGH.—By M. Debreyne

Belladonna has been eminently useful in the epidemics of hooping-cough, which M. Debreyne has observed; but the success attending its administration depends on the observance of the following rules. The dose of belladonna should be proportioned to the number of months representing the child's age; and the quantity to be taken in twelve days, (the ordinary duration of treatment) will be five centigrammes (¾ of an English grain) multiplied by the number of months. Thus, for an infant six months old, the dose will be thirty centigrammes (4½ grains) in twelve days; for one of two years and a half, the dose will be 1½ gramme (23 grains) in the same period. For children above six years of age, the quantity of three grammes (46½ grains) is not exceeded. The medicine is always given three times in the day. For instance, the prescription for a child three years old would be—powder of the root of belladonna, two grammes; to be divided equally into twelve powders, of which one is to be divided equally into twelve powders, of which one is to be given daily, in three divided doses. If there be vomiting, it should be given immediately after a fit of vomiting and coughing. Recourse should not be had to this remedy, until the inflammatory element has been overcome by leeches, emetics, etc.; in other words, it is not to be employed before the tenth or fifteenth day, when the cough will have assumed its specific character.—*London Journal, April* 1850, *p.* 386.

DISEASES OF THE ORGANS OF DIGESTION.

55.—ON DIGESTION.—By Dr. H. Bence Jones, A. M., F. R. S., Physician to St. George's Hospital.

All vegetable food contains four classes of substances,—first, water; secondly, ashes; thirdly, non-nitrogenous organic substances; fourthly, albuminous organic substances. Milk, as regards the quality of its constituents, is no more the type of food than wheat is. Both contain the same four kinds of substances—the difference is in the quantity of water present. Without quantitative analysis, this is made clear by the fact that we could live without water being added to our milk, but scarcely without its being taken with our bread.

Bread and water together are the type of the food of man, as milk is of the food of the child. Both contain some fleshy, some fatty, some bony, and some watery particles; but the quantity of water naturally present in milk is sufficient to dissolve the other substances present in it when circumstances favour their solution.

The process of digestion has been divided into a process of reduction, a converting process, and a vitalizing process. In my last lecture, I told you that the conversion of a substance belonging to one of the four classes into which food may be divided, into a substance belonging to another class, is neither proved nor probable, so that your idea of digestion may have this separated from it.

The term reduction arose from sugar which contained much water being sometimes called low sugar. Whether the water was chemically combined with the substance or not, was not very clearly expressed. Instead of the term reduction, I shall always use the word solution, which I can more easily understand. Regarding the so-called vitalizing process, I can form no clear idea of it, and so I shall not, by talking about it, enable you to understand what is meant thereby. You will say, then, does the process of digestion mean only a process of solution and nothing more? I think you will see that digestion must not be so limited. Food is dissolved, then it is absorbed, and then it is said to be made into blood, made like to the blood—assimilated is the one complex word at present used. If the solution and absorption are included in the word digestion, we may speak of food as first digested, and then assimilated to the blood. Rarely the term digestion is used when absorption only is meant, the food being dissolved, or being a liquid before it is taken into the stomach. Thus you may read of the digestion of a mineral water, meaning its absorption. In my lecture to-day, I shall attempt to make clear to you more especially the first of these three different processes—1, solution; 2, absorption; 3, assimilation.

The quantity of water present in vegetables is not sufficient to dissolve the nitrogenous and non-nitrogenous organic substances, and the salts which they contain. Even if these three classes were all soluble in water, there is not enough of this fourth class, water, present to hold the other classes in solution, and thus enable them to pass into the blood.

The more soluble a substance is, whether nitrogenous or non-nitrogenous, or saline, the more quickly does it pass into the blood. Some substances, —as sugar, for example,—are readily soluble in water, and water only is requisite to prepare such for absorption. Woody fibre, on the contrary, and green colouring matter, are very insoluble in water and partly from this chemical property, and partly from the mechanical properties, the texture of the woody fibre, it is with difficulty made soluble. Nitrogenous substances, as regards their solubility, differ much in their chemical and mechanical properties. Generally, the more minutely any substance is divided, the more easily will it be dissolved. Division gives surface for the fluids to act on; and the force of cohesion is by the division already overcome.

The first most essential requisite for solution is that some solvent for the food should be present. If the solvent be pure water, then the food must consist of substances soluble in pure water. If the food consists of nitrogenous, non-nitrogenous substances, and salts, then, if these be not soluble in water, the solvent must be some fluid different from pure water. From the best experiments, it is admittted that the solvent in the stomach is an acid liquid. It is shortly named the gastric juice. Before I describe the nature and properties of this solvent gastric juice, I will mention some other points regarding the solution of food. Having obtained a solvent, the second most essential operation is to divide the substance to be dissolved, as finely as possible. That food which is most capable of being finely divided, will for the most part be most easily dissolved. Herein the advantage chiefly consists of tender meat over tough; of stale bread over new; of yolk over white of a boiled egg; of fish over flesh. The third essential point is, that an excess of the substance to be dissolved should not be taken. A given quantity of water cannot dissolve an unlimited quantity of even sugar or salt. A given quantity of dilute acid cannot dissolve an unlimited quantity of albumen; and any given quantity of the gastric juice cannot dissolve an unlimited quantity of food. Moreover if too much non-nitrogenized food is dissolved, the excess must be deposited as fat, or thrown out by the excretions; and if too much albuminous food is taken, it must accumulate in the blood, or be thrown out of the blood; and fat and plethora are not the only evils too much food causes. If an excess is taken into the stomach, the irritation causes the greatest possible secretion of gastric juice. If too little gastric juice is poured out, a portion of the food will remain undissolved, and sickness or disorder of the bowels will result. If too much gastric juice is poured out, heartburn, pain in the stomach, and flatulence, are produced. Excessive irritation of the stomach and its never-failing consequence, excessive acidity, may be produced not only by too much food, but by certain kinds of food. The error may be as great in the quality as in the quantity of food. The bulb of a thermometer, a probang, and metallic balls, have been used to excite the secretion of acid in the stomach; and hard, solid food, or highly stimulated pepper, frequently causes excessive irritation of the stomach, and excessive acidity and flatulence, and increased muscular action, sometimes as spasmodic and painful as any cramp in the extremities. These effects depend much on quality as well as on the quantity of food. The mechanical properties of the food, even more than their chemical ones, are concerned in causing this irritation; but dilute sulphuric acid, vingar, or sugar even, which can become acid, will cause as much pain as the toughest meat, or the hardest potatoe.

You see, then, why unirritating food, in the finest state of division, and in moderate quantity, can prevent and cure that form of indigestion which depends on an over-irritable state of the mucous membrane of the stomach.

I must return now to the nature of the gastric juice, and to its action on the different classes of substances of which our food consists.

On the Nature of the gastric Juice and the Changes it Effects on Nitrogenized and Unitrogenized Food.—On the 5th of March, 1849, breakfast having been taken at eight A.M., on boiled beef, bread, and spring water, at 9.45, by position and voluntary effort, about a pint of substance was ejected.—The first ounces were scarcely acid to the taste; the last portion was most intensely acid. The whole quantity was thrown on a filter, and a clear, yellowish-brown liquid passed through. This clear liquid was intensely acid to test paper. It coagulated slightly on the addition of nitric acid and heat. The cold acid caused a deepish yellow colour and a coagulum, which appeared partly to be soluble by heat and precipitable by cooling. The specific gravity=1008.2. 504.1 grains, evaporated in vacuo over sulphuric acid, evolved a small quantity of gas.

Residue + basin . . . . . . = 549.3 grains.
basin . . . . . . = 505.0 "

March, 15th.—Residue . . . = 44.3 grs. =8.8 per cent.

The residue was yellowish, semi-transparent, took the impression of the nail, smelt of musk and sugar? When mixed with cold distilled water it became ropy and very adhesive. The solution was highly acid. The taste was sweet, acid, bitter, nauseous. A few drops of the solution with sulphate of copper and liquor potassæ, gave an intense blue, with a trace of purple; and the reduction of the oxide of copper was very rapid, excessive and red.

In this bottle you see this gastric juice. Here is its strong acid reaction on litmus, and here you see the rapid reduction of the oxide of copper.—The food being bread, it is probable that some of the sugar was formed in the process of fermentation, and not produced altogether in the stomach.

This gastric juice, then, is a highly acid fluid secreted by the stomach. It consists—1, of water and free acid; 2, of salts; 3, of non-nitrogenous organic substances; 4, of albuminous or nitrogenized substance. Of these substances the most important is the free acid. What acid it is has not yet been determined. Hydrochloric, phosphoric, acetic, lactic, and butyric acids, have each been said to exist in the gastric juice. The hydrochloric phosphoric are mineral or inorganic acids. The rest are organic acids,—possibly arising from starch, sugar, or fat, or other components of the non-nitrogenized part of our food. Thus these organic acids might be formed; but when can the inorganic acids come? Hydrochloric and phosphoric acids exist only in the food and blood, combined with soda, potash, or lime; as in common salt, phosphate of soda, or phosphate of lime. To set free the acids, the alkalies must be separated. If one equivalent of hydrochloric acid is set free in the stomach, one equivalent of soda must be set free in the blood. The greater the quantity of acid in the stomach the greater the quantity of alkali in the blood, and the more alkaline the serum must become.

Whether this is effected by galvanic action, nervous action, or muscular action, is at present altogether unknown. Those who say anything say it is by vital action. Whatever may be the nature or seat of the decomposing force,—whether galvanic, nervous, or muscular,—whether in the cells of the epithelium of the stomach-tubes, or in the muscular structure,—we cannot admit that inorganic acid can be poured into the stomach without an equivalent quantity of alkali being set free in the blood. When digestion is completed, the acid is re-absorbed with the food, and the alkalescence of the blood must be altered in the opposite direction. When the stomach is empty, there is little if any acid there then. When food is taken, the quantity of acid begins to increase, and gradually reaches the greatest amount poured out; and then by absorption, or by escape through the pylorus, the quantity of acid begins to decrease, until the stomach is again empty.

For the purpose of keeping up a constant supply of at least one inorganic acid, man has been led at all times, and in all circumstances, to seek for salt as necessary to his existence. What the influence of chloride of sodium undecomposed, and of other salts, is on the solubility of albumen or starch, has not yet been sufficiently determined.

The next most important constituent of the gastric juice, after water and acid, is the albuminous substance. Its exact nature is not known. I cannot consider it as epithelium. It is far more likely to be a substance like diastase; not albumen, not epithelium, but a peculia albuminous stubstance. Its exact composition is not known; but probably it is a substance undergoing changes which it can communicate to other contiguous substances. It was precipitated by weak alcohol from infusion of pig's stomach, by Wasman, and he called it pepsin; it requires re-examination.

The non-albuminous organic substances in the gastric juice are the organic acids and fatty substance; the latter probably exists in a very small quantity. This complex gastric juice cannot act precisely in the same way on two classes of substances so very different as nitrogenized and non-nitrogenized food.

Firstly. *The action of the gastric juice on the nitrogenized substances in the food.*—The fine state of division of the food, the smallness of its amount, the constant muscular motion of the stomach, and the temperature of the body—these all assist the solution of fibrin, albumen, or casein. Strong acids very easily dissolve these albuminous substances, and the dilute acid of the stomach, in consequence, perhaps, of some influence of the nitrogenized pepsin, or animal diastase(?), is made to act as energetically on the albuminous food as strong acid would do. In this action there is nothing vital; it takes place as well out of the body as in it. The elements of the albumen cannot be converted so as to form water, salt, sugar, or fat. There is no formation of incipient albumen. If you please to call solution, reduction or combination of water with the substance dissolved, you may say the albumen is reduced; to me it is far more simple and quite as comprehensible to speak of it as a process of solution, and as nothing else.

Secondly. *On the action of the gastric juice on non-nitrogenized food, starch, sugar, fat, &c.*—Starch is perfectly insoluble in water and in dilute acids, but by the action of dilute acid it easily undergoes a change, by which it is rendered soluble. The action of strong sulphuric acid on starch, and the formation of sugar thereby, is probably well known to you already; but there is no strong acid in the stomach.

The relation of starch to British gum, or dextrine, or, as it has been called, soluble starch, is also well known to you. There are many ways of changing the insoluble starch into soluble dextrine. One very perfect method has been practised in France, of treating the starch, at the temperature of 100° Fahr., with dilute hydrochloric or oxalic acid, and thus dextrine is readily formed. There is no doubt that the temperature and dilute hydrochloric acid in the stomach effect the same conversion as you see has been effected in this flask; further action of the acid and heat converts the dextrine into sugar. It has been said, that the starch is acted on by the alkaline saliva, but directly the saliva reaches the stomach, it must be neutralized by the gastric juice.

On the action of gastric juice on sugar.—The ready solubility of sugar in water requires no illustration. A portion of the sugar which is taken as such, or is formed from starch in the stomach, without doubt passes into the blood as sugar; but it appears to me highly probable, from Freny's experiments, that a portion is changed into some of the vegetable acids. The acetic and lactic acids may thus be formed, and these, in part, perhaps may become lactates and acetates of soda in the blood. And we know, from direct experiment, what happens to vegetable acid, salts injected into the blood, or taken into the stomach; they are oxydized or burnt, giving heat and carbonic acid salts, which pass off in the urine. All free vegetable acids are probably changed partly into carbonic acid in the blood. Thus, then probably the progress of a grain of starch may be traced. It forms, first, dextrine; secondly sugar; thirdly, vegetable acid; fourthly, carbonic acid.

The ascending conversion of sugar into albumen cannot be admitted until it is proved. There is not an experiment which renders such a change probable.

The descending conversion of sugar into fat, a substance also containing no nitrogen,—that is, of one kind of non-nitrogenized substance into another kind belonging to the same class,—is most fully proved. Bees fed on crystallized sugar made wax, and animals form more fat than the food they are fed with contains; but this fat is not formed in the stomach, and therefore does not concern us now. The changes take place in the minute textures of the body, and not in the stomach.

On the action of the gastric juice on fat and oil.—How is fat made soluble at the temperature of the body? Is oil absorbed? The following is an experiment by Tiedemann and Gmelin. A dog was fed for four days on butter; three hours after the last meal he was killed.

a. Stomach contained butter, and the contents were very acid. *b.* Small intestine contained butter and bile, and was acid strongly. *c.* The cœcum contained butter. *d.* The rectum contained butter. *e.* The chyle was very milky, and cleared with ether. *f.* The blood of the vena cava inferior contained much fat. *g.* The urine was thick; filtered, butter soluble in alcohol was left on the filter. They add: "One of our pupils who likes fat has frequently found it in his urine." This has also sometimes been observed after cod-liver oil. Oil and albumen form an emulsion slightly soluble in water; but the pancreatic fluid and the bile are generally considered as the agents which make the fat and oil of the food soluble.

Lastly, the phosphates and sulphates of soda, chloride of sodium, are soluble in water. The earthly phosphates are dissolved by the hydrochloric acid. Even silica, in minute quantity, is contained, dissolved in water, and hence these salts pass into the blood.

I may sum up the conclusions of this and of my former lecture thus. Each meal may be separated into these four classes of constituents—albuminous substances; non-nitrogeneous organic substances, as starch, sugar, alcohol, fat; salts; water. Digestion of any meal is the solution in the stomach of these different substances, and their absorption from the bowels.

The formation of the gastric juice is certainly no chemical process, but its action is entirely chemical, though it is aided by the motion which the muscular coat of the stomach produces; and muscular contraction is as distinct as sensation from chemical action. Nor can the absorption of the dissolved substances be altogether considered as a vital action. It is certainly subject to the laws of the diffusion of one liquid into another, to the laws endosmosis, or diffusion through a membrane, and to capillary action. —*Lancet, Jan.* 19, 1850, *p.* 69.

56.—ON THE ACTION OF SUGAR, COFFEE, ALCOHOL, AND WINE ON THE ANIMAL ECONOMY.—By Dr. Bocker.

[Dr. Bocker, we are told, divides aliments in two orders:—1. *True aliments*, which comprise most azotized substances, and which are truly nutritive; and, 2. *False aliments*, or non-azotized substances, which may keep up life for a time, but which do not really repair the tissues. In the latter division are included the substances spoken of in the following remarks:]

Sugar.—Several healthy persons, among whom was the author, subjected themselves to a sugar diet. The experiment was conducted with great care; accurate analysis of all the excretions were made before, during, and after the use of sugar, so as to ascertain with exactitude the influence of that substance on the constitution, and on the egesta of the organism. It was found,—1st. That sugar diminishes the exhalation of carbonic acid from the lungs. In the normal state the mean of the acid exaled was 19 cubic inches in a minute, with the sugar it fell to 18. The amount of water contained in the expired air fell likewise by the use of sugar, the difference between the sugar diet and the use of bread and meat being, within twenty-four hours, about five drachms of water less in the former case. The cutaneous secretion did in the meantime not increase. 2d. The sugar diet was found to diminish considerably in the quantity of animal extractive matter and phosphates in the urine. These results are quite in accordance with those obtained by Chevreul and Mageudie, which go to prove that the phosphates disappear from the urine of dogs exclusively fed upon sugar. It has been maintained by some authors that sugar was decomposed within the body, and produced latic acid, which, acting on the phosphate of lime of the bones, rendered the salt soluble, and caused its elimination from the economy. This supposition must give way before Dr. Bocker's experiments, since they prove the very reverse to be the case—namely, that phosphates are eliminated in very small quantity, and may even be entirely absent from the urine when the sugar diet is used. Sugar, therefore, may be looked upon as finally diminishing the amount of excrementitious detritus which is produced by the phenomena of nutrition. This fact will be apparent when it is considered that during nutrition a continual composition and decomposition of the tissues of organs are taking place. The elements of repair are taken from the food and blood, whilst the worn-out particles are eliminated by the lungs and the kidneys, in the form of water carbonic acid, urea, extractive animal matter, phosphates, &c., &c. The intensity of these changes is represented by the quantity of excreted material. When the amount of the latter is diminished, a retardation in the phenomena of utrition may be inferred, and this retardation is one of the effect of the sugar diet. Hence sugar, which cannot be considered as an element of nutrition, may, nevertheless, concur in the maintenance of life. Its action differs from that of a really nutritious substance in this respect, that the latter furnishes elements which promote the nutritive or destructive activity of organic tissues, whilst the saccharine substance does not yield anything to the organs, but moderates their nutritive phenomena, producing an economy in the quantity of the materials of repair employed, and, consequently, a diminution in the excretory products, resulting from the waste of the tissues. These views, which, at first sight, seem exclusively of a physiological nature, will easily bear a therapeutical application. The physiological action of sugar may indeed become of great therapeutical value, in certain pathological states. The author considers scrofula as depending on two causes:—first, on insufficient food, and unfavorable hygienic circumstances, capable of bringing on deficient nutrition; second, on a hyper-activity in the nutritive and destructive changes of organs, which may bring on a wasting of the individual. If the disease depend on the first cause, the measures to be employed are obvious—abundance of food and better hygienic arrangements; if it depend on the second cause, (a circumstance which may be ascertained by noticing the larger proportion of excretory products,) the disease should be combatted by an agent capable of diminishing this too great activity. This agent is no other than sugar; and the author quotes several cases of scrofula belonging to the second of the two categories mentioned above, which were finally cured by mixing a large proportion of sugar with the patient's usual food.

Malacosteon may also be referred to two causes; first, the food of the individual may contain an insufficiency of earthy salts; (the fact of dogs and chickens becoming rickety, when fed upon substances containing no phosphate of lime, is well known); or secondly, the phosphates which are to repair the skeleton are too rapidly eliminated. In both cases, earthy phosphates should be added to the patient's food, but if too rapid an elimination of these phosphates exist, it should be checked, and this will be easily affected by adding a large proportion of sugar to the food. The author has treated a great many cases of this kind with great success, by giving powders of calcined bone mixed with sugar. When a child at the breast is affected with this disease, owing to the poverty of the milk, the mother should take the calcined bones, but without the sugar, in order that the elimination of the phosphates through the milk may not be interfered with. It may, in such cases, be ascertained that the milk contains a larger quantity of phosphates than usual. In one of the cases cited, the child was affected by craniomalacia, and the mother's milk was found to contain ten times less phosphate of lime than ordinary human milk. This secretion was much improved by the administration of the bone powder for a protracted period, and the child got rid of the softening of the brain box. It has likewise been discovered, by repeated examinations of human milk, or that of animals, that the sugar contained in it is always in an inverse ratio with the azotized matter—namely, casein.

Coffee.—This substance acts upon the nervous system in an especial manner, which fact the author ascertained by experiments upon himself. The symptoms produced by large doses were a diminution of appetite, slow digestion, and an uneasiness of respiration simulating asthma. The number of inspirations and the amount of carbonic acid and water exhaled were likewise diminished. The blood in the veins had a darker tint, and the globules did not redden easily by the contact of the air. As to the urinary secretion, it was found that the phosphates were as abundant as usual, whilst the urea, uric acid, and other organic matters, were considerably diminished. The author concludes that coffee presents the characters of a false aliment, as it diminishes the destructive metamorphosis of the organs, and may be employed in diseases where this metamorphosis is too active. But coffee has likewise the property, when taken in a sufficient dose, to excite the nervous system, and may therefore be looked upon as the incentive of the rich, and the consolation of the poor. It is a comfort to the poor, since it appeases hunger, and renders an indifferent meal more substantial; and it excites the rich by its action on the nervous system.

Alcohol.—By the use of alcohol, the carbonic acid exhaled by the lungs was diminished. Alcohol acts, moreover, in an especial manner, on the brain, and on the circulation, which latter is rendered slower by its use. But alcohol acts, finally, like sugar and coffee, since it likewise retards the destructive metamorphosis of organs. So that alcohol, looked upon as an aliment, supports the economy without nourishing, when taken in certain doses, and not acting on the brain; because it prevents the wasting of organs to go on so fast as usual. As a therapeutical agent, alcohol has been observed to increase the density of the liver with people who use it habitually.

Wine.—The experiments were made with white Rhenish and with red wine. The results were not similar in both cases. By the use of the white wine the urinary secretion, the watery exhalation from the lungs, the carbonic acid given off by the same organs, and the solid portions of the urine, were augmented. Thus it will be seen that the Rhenish white wine increased the nutritive activity instead of moderating it. Red wine, and Bordeaux in particular, produced a contrary effect; the urea and solid matters of the urine were diminished, and certain solid matters yielded by the wine were found in the urine. There was likewise a diminution in the respiratory movements and the amount of carbonic acid and water given off by the lungs. Red wine, therefore, by supporting the strength of the system, acts like other false aliments.

By the foregoing considerations, then, it will be seen that nutrition, considered as a continual destruction and renewal of organs, may be effected in two different manners. The first, by furnishing a sufficiency of material for this organic renovation; the second, by delaying or diminishing the organic destruction, which constantly requires repairing materials. The first end is attained by the *true aliments*, the second may, according to the author, be accomplished by the *false aliments.—Lancet, Jan.* 26, 1850, *p.* 119.

57.—ON THE TREATMENT OF NERVOUS GASTRO-INTESTINAL AFFECTIONS BY CHARCOAL.—By Dr. Belloc.

The academy of Medicine of Paris, to whom a memoir was presented on this subject by Dr. Belloc, have just published a report very favourable to the author. From this document we gather, that poplar-wood, prepared in the manner pointed out by Dr. Belloc, is the most efficacious. The powdered charcoal is to be taken in doses of one or two tea-spoonfuls before meals; a pleasant feeling about the epigastrium and some appetite are excited by it, and if taken after a meal it renders digestion more active and rapid. This inert powder seems neither to be digested nor absorbed: it merely passes through the digestive canal, and takes hold of the gases and liquids hurtful to the economy. The charcoal powder keeps the bowels open with those patients where gastralgia is complicated by constipation, and its effect is not confined to rendering digestion better, but it likewise allows of more tonic and abundant food being used, whilst it renders the stomach more fit to bear such active remedies as were but ill borne before. The powder may be given in the form of pills or lozenges, but Dr. Belloc prefers administering it in cold water, in the shape of a moist paste, of which a tea-spoonful is swallowed, half a glass of water being drunk upon it. Some patients, in the hospitals where members of the committee prescribed the powder, found the charcoal very repulsive in that form, and the physicians were obliged to give it wrapped in bread. The doses vary from two to six spoonfuls per diem, according to the severity of the disease: this dose, however, may gradually be increased, as Dr. Belloc has himself taken sixteen ounces in one day. Very chronic gastro-intestinal affections are modified in a few days by the use of the charcoal. Several cases of a very satisfactory character are appended to the report, and we decidedly think that trials ought to be made in this country, where gastric affections are so frequent.—*Lancet, April* 27, 1850, *p.* 504.

58.—ON A PECULIAR AFFECTION OF THE INTESTINAL MUCOUS MEMBRANE, AND ON ITS TREATMENT BY ELECTRO-GALVANISM.—By Dr. W. Cumming, Secretary of the Edinburg Obstetrical Society.

[Dr. Cumming gives a detailed account of a disease, which, he says, is not described in systematic works, but which is nevertheless very common, and is productive of serious discomfort to the patient. Dr. C. says:]

We are often consulted by patients who, at the first glance, convey the impression that they are imperfectly nourished: they have an emaciated appearance. In detailing their symptoms, they lay great stress on a feeling of emptiness, or rather faintness, at the ipigastrium: they complain of exhaustion there. They generally next direct our attention to a more or less fixed pain, either in the left hypochondriac or iliac region, sometimes both, more frequently the latter,—a pain from which they are rarely exempt, and which is sometimes very severe and acute, though oftener annoying and irritating. If they have ever been induced to apply a mustard blister to the seat of pain, they dwell on the relief, great, though temporary, they have experienced from it. The stomach, in most of the cases I have seen, has not been irritable: it commonly retains and digests the food; but pain is frequently felt in the course of the colon, in a period varying from an hour to two hours thereafter. The bowels are at one time constipated, at another lax, in the same person. Some are uniformly costive, others more frequently loose; but in all (*and this is the characteristic mark of the disease*,) a peculiar membranous, fibrinous matter is discharged. In some cases it is stringy, in others tape-like in its form; in others, again, in small masses, resembling fat; while in the milder cases it is more diffluent and gelatinous. That the disease has, from want of proper examination of the intestinal evacuations, frequently eluded observation, I know too well from my own experience, and that it has consequently been maltreated does not admit of doubt. The last thing the patient will mention (if, indeed, he mention it all) is the characteristic discharge. When the doctor directs his or her attention to it, they will hesitatingly admit that they may *possibly* have remarked it—nay, even when they are informed that scarcely a stool passes without more or less of it, they will often fail to discover it; and hence no practitioner should rest satisfied when he has reason, from other indications, to suspect the affection, till he has himself examined the fæces most carefully, particularly when separating the fluid from the solid matter. In the former he will rarely fail to discover flakes or streaks, or even small masses: these, if discovered, will lead, at future opportunities, to the detection of larger and more unmistakeable portions of the abnormal secretion. To take the report of the appearances from the patient is, in too many instances, the surest way to deceive both you and himself. In addition to this, there is not unfrequently a considerable discharge of blood from the bowels, and that, too, where no hæmorrhoids can be detected. Almost uniformly there is great pain during evacuation, and always a feeling of exhaustion for some time after. In most of the patients there is a peculiar expression of countenence, so striking that one who has seen many such cases can, with tolerable certainty, tell, without more minute examination, what the nature of the complaint is. It is an expression of anxiety, quite different, however, from that which usually marks organic disease. You do not conclude, as is too often the case with the latter, that your patient is laboring under an incurable malady.

Scarcely less characteristic of the disease than any of the preceding symptoms is the state of the mind. In all there is more or less nervousness, greatly increased towards night, inducing sleeplessness; and when, towards morning, sleep does come on, nightmare is frequent—dreams (generally of an unpleasant nature) invariable. One lady was troubled with spectral illusions. Prof. Simpson has informed me that he has remarked, in most of the cases that have come under his observation, a deficiency of memory in regard to words; the patient knows what he wishes to express, but cannot find the expression at the moment. In my own experience I have not observed this so frequently, and certainly in very many cases it is wanting.

When the affection has been of long duration (and too frequently this is the case before we are consulted) the mental irritability is very great; and what is more painful still, the patient's feelings and views are perverted and distorted. It is unnecessary to add that they are miserable in themselves: and, where the nature of the affection is unknown to and due allowance not made by their companions and friends, the cause of misery to others. They are quite sensible that they are not what they formerly were—that they are changed for the worse: they feel, moreover, that they have little control over their mental state, and are apt to fall into a condition of great depression and despondency. If I were to express their internal feeling in few words, I would say that they have a mixture of irritability and despondency, relieved from time to time by happier feelings, but those of comparatively short duration.

In endeavoring to trace the history of the disease in each individual case, we are generally told by the patients that they cannot indicate the precise time when their symptoms arose. Not unfrequently they ascribe their origin to drastic medicine; and I believe that the pernicious habit (now, happily not so common as formerly) of taking aperient medicines in one form or another, is by far the most frequent cause; but it is certainly not the only one. It is vastly more common in the female than in the male sex, though by no means uncommon in the latter; and in the former it is very often accompanied by dysmenorrhœa, and occasionally by the membranous form of that affection.

1. The primary, and, I believe, indispensable point is total, or almost total, abstinence from aperient medicine. With this view, I was till lately in the habit of relieving the bowels every third or fourth day by enemata of simple warm water, or with the addition of a table-spoonful of oil, and perhaps every ten or or twelve days a dose of castor-oil by the mouth. These means, simple though they be, do mischief; and, therefore, it was desirable to discover a mode of effecting the object without the disadvantage of its being at the same time an irritant.

2. External counter-irritation. This, in the form of a mustard blister every night or second night, gave considerable but temporary relief, and was always most grateful to the patient; but in very many instances it failed utterly, and, where it did benefit, the relief was transient.

Circumstances, which I need not at present detail, led me to surmise that electro-galvanism would accomplish both these indications of treatment without the disadvantages with which the other means were chargable; and the results of its use in a considerable number of cases of this disease, warrant me, I think, in affirming that it is competent of itself to the cure of almost every case, and that, aided by an internal medicine which I shall refer to presently, it will cure both certainly and speedily. In the first place, it acts as an aperient,—seemingly by its action on the muscular coat, as well as the mucous membrane of the bowels. *In every case* in which I have used it this has been the effect; and if it had no other consequence than this, the advantage would be prodigious; for as in a multitude of instances the disease has been traced to the use or abuse of laxative medicines as a cause, and as during the treatment even the mildest aperients irritate the membrane, and so far aggravate (temporarily) the disease, the evacuation of the bowels, by any means that do not irritate, is obviously of great consequence. But the electro-galvanism does more than this: for 2ndly, it induces such a state of the bowel as prevents the formation of the peculiar secretion: that is, it restores it to a more healthy condition. I purposely avoid using expressions which might involve a theory as to its mode of action, and do not profess to tell how this result takes place: the fact itself is indubitable. 3rdly. it supersedes counter-irritation. The pain in the side, for the removal of which the counter-irritant was employed, is relieved by an application of the galvanism for at least twenty-four hours; in many cases for a much longer period; but as the agent is applied once a day, where no contra-indicating cause exists, till the disease is removed, the pain may be said to be abolished.

Galvanism, therefore, might of itself effect a cure; but I have generally combined it with the internal exhibition of tar, and have thus effected cures in a much shorter time than by either of these means singly. For some time I was in the habit of giving internally the nitrate of silver, arsenic, or cod-liver oil, as circumstances directed; but latterly I have confined myself to the adminisiration of tar, suggested first, I believe, by Dr. Simpson, and have found it of all internal means by far the most effectual. It relieves the feeling of exhaustion at the epigastrium, imparts an agreeable warmth, and promotes appetite and digestion; but by itself it is long in effecting a cure, even in slight cases, in all the trials I have made of it. The plan I have hitherto adopted has been, to give the tar, in the form of pill or capsule, thrice a day; the electro-galvanism (Kemp's of Edinburgh, machine is the one I have used), is applied for a quarter of an hour daily, the intensity being increased from time to time. Steady perseverance is requisite. With this the case must be obdurate indeed that will resist a cure.

One remarkable fact connected with the treatment of galvanism is, that it *determines* the portions of the bowels where the greatest amount of irritation exists—a knowledge which manual pressure fails to convey: for it is a singular truth, that when the instrument is in action, extreme tenderness is complained of in more than one well-defined spot or tract, of which the patients were not previously aware, and quite distinct from the regions to which the attention of the doctor is directed as the seat of pain. And it is extremely interesting to observe how this tenderness after a time and the continued use of galvanism, diminishes till a mere point is fixed on as its seat, and how this also is removed; after which the disease may be said to be extinguished, though I have seen reason to persevere at more distant intervals in the application of the agent, for the sake of confirming the recovery, strengthening the nervous system, and conducing to the self-regulation of the bowels.—*Med. Gazette*, *Dec.* . 7, 1849, *p.* 969.

59.—USE OF TURPENTINE IN FLATULENT DISTENSION OF THE ABDOMEN.—By Dr. T. Smith. Cheltenham.

This is a distressing symptom, which often accompanies a dyspeptic state of the system, especially in gouty patients. It is sometimes attended with nervous excitement of the heart, sometimes accompanied by spasm of the bowels, and dyspnœa. For the relief of this symptom, whether originating from mal-assimilation of the food, or supervening on obstruction of the bowels, or occurring after an operation for strangulated hernia, I have found no medicine so efficacious in quickly dispelling the flatus, as oil of turpentine. In gouty subjects, who freely secrete lithic acid, and who are much troubled with this kind of flatulency, I have rarely ever experienced that small doses of the oil of turpentine with or without colchicum have failed to afford very great relief more particularly when accompanied by a mild diuretic course of Cheltenham salines. It is of the greatest importance to avoid active purgation in this state of the system.—*London Journal, April* 1850, *p.* 343.

60.—ON THE BEST MEANS OF OBTAINING THE PURGATIVE OPERATION OF CALOMEL.—By Dr. J. C. Hall.

For the purpose of obtaining the best purgative effect of calomel, Dr. Hall recommends it to be mixed with a little table salt, and placed dry upon the tongue; no other purgative being combined with it, and the patient abstaining for some time from taking water or other fluids. Dr. Hall observes]

This is a point of practical importance, and well worthy the attention of the practising surgeon and physician. It is a well known fact that the inhabitants of maritime localities, and sailors, after a long voyage, in which they have been deprived of the use of fresh provisions, and kept upon salt meat, are more liable than others not so circumstanced to the influence of mercurial preparations; which arises in the opinion of Mialhe, from the bodies of such men containing large quantities of the alkaline chlorides,—so that there is more complete conversion of calomel into corrosive sublimate than under the usual state of the body.

Children, and patients confined to a milk diet, support large doses of calomel, because the fluids in their alimentary canals are destitute, or contain only very small quantities of the alkaline chlorides. Patients, also, who have lived for a long time on broth, or low diet, the fluids of whose bodies are also exhausted of chlorides, consequently bear larger doses of calomel without the system becoming effected.

To Dr. Mialhe we owe, also, the explanation why calomel acts best as a purgative when put dry upon the tongue, with the addition of a few grains of salt, he says: "that the action of insoluble remedies must be inversely to the quantity of water administered with them; and this he has proved by actual experiment, For example, if nine grains of calomel, nine grains of table-salt, and the same quantity of muriate of ammonia, are put into seventy drops of water, there will be produced, in twenty-four hours, one-third of a grain of the bichloride of mercury. Place the same ingredients in a vessel, and add to them one hundred and forty drops of water, twice the quantity—and the result will be one-quarter of a grain of corrossive sublimate; but if we add to the same substances four times the quantity of water, one-sixth of a grain of corrosive sublimate only will be formed: "hence," writes Dr. Mialhe, "it is clear the purgative effects of calomel are lessened by taking a large draught of water immediately afterwards." The whole subject of the administration of medicines is fraught with much interest, and is one well worthy the attention of the medical profession in this country.—*Med. Gazette, Feb.* 22, 1850, p. 320.

61.—ON THE USE OF IODIDE OF POTASSIUM IN SYMPATHETIC VOMITING—By Dr. A. C. SELKIRK, Carlisle.

Ricord, in speaking of the properties of this salt, particulary as it influences the symptoms and characteristic phemomena of tertiary accidents, remarks that large doses seldom or never cause vomiting. I am of opinion, from a considerable experience in the use of the salt, that it is one of the most powerful agents we possess of allaying the irritability of the stomach; and what seems of more practical value, the property the salt exhibits, in combination with infusion of quassia, of allaying the sympathetic irritability of that viscus, consequent on some distant local irritation—for example, in the constitutional irritation manifested in lumbar or gluteal abscesses. At the period of writing these notes, I have a case of gluteal abscess under treatment, which illustrates the practical interest of the remarks submitted. Local depletion, counteraction with usual remedies, failed to produce resolution; pus formed deep under the gluteal muscles, and was discharged by puncture. The constitutional disturbance at this period was not great, albeit the disease had existed for six months. The general irritation, however, became violent after the abscess had been discharging for six weeks, the stomach rejecting all the injesta, both solids and fluids. Opium, small doses of castor oil, with the neutral salts, quinine, &c., were had recourse to without the slightest mitigation in the symptoms; the patient lost flesh rapidly. Pulse 110, weak; he was evidently fast passing into an extreme anæmic condition. At this juncture he was ordered—idoide of potass, two drachms; infusion of quassia two pounds. To take half a wineglassful three times daily. The vomiting and irritability of stomach ceased after the third dose, the secretions of the alimentary canal improved, and the patient, from that period, rather gained ground. He is clearly, however, of the strumous diathesis, and although the abscess has no connection with hip-joint nor psoas muscles, still, from its extent, dissecting deep under the gluteal muscles, and the great amount of constitutional disturbance set up, the prognosis is unfavorable. I have used the iodide in several cases of the above-mentioned description, with similar results. I am not aware of this property of the salt having been previously adverted to.—*Lancet, Dec.* 15, 1849, *p.* 636.

62.—CASES OF TAPE-WORM TREATED BY "KOUSSO," A NEW REMEDY.

[The "Kousso," or Brayera Anthelmintica, (a plant of the natural order Rosaceæ,) was introdued into notice by a pharmacien of Paris, and its properties as an anthelmintic were investigated by the Academy of Medicine so long ago as 1847. The report of the above-named body, as also of the Academy of Sciences, was extremely favorable. The remedy has not yet been given in this country, so far as is known, except in the cases detailed below, which were treated by Dr. Budd, at King's College Hospital. We are told that]

The parts of the plants used are the flowers, which, being reduced to a fine powder, are macerated in lukewarm water for fifteen minutes. The infusion, with the powder suspended in it, is taken either in one, two, or three doses, quickly following each other. It is recommended that lemon-juice should be taken freely before and after the kousso. The patient must be prepared by low diet for a day previously, and the medicine taken on an empty stomach before breakfast. The clear infusion has the color, and a somewhat similar taste, to very weak senna tea. It rarely causes any annoyance or uneasiness, except a slight nausea, and this but seldom.

The first woman to whom the kousso was given had generally enjoyed good health. From her account, it is probable that she had not been troubled with tapeworm previous to her coming to London, a year and a half ago, during which time she had resided in Tooley-street, Borough. When the first symptoms came on twelve months since, she took oil of turpentine and castor oil, under the use of which a large portion of tænia passed. She had at first a ravenous appetite, which passed away, leaving a constant feeling of flatulency in the stomach. Langour, general debility, incapacity for work, and nausea, were her chief symptoms. During the four months preceding her admission, she was constantly taking various remedies, such as turpentine, &c., under the direction of her medical attendant; but with none of them was the worm passed.

When admitted into the hospital, she was ordered half a drachm of jalap and low diet, and subsequently other purges, but without bringing away any joints of the worm for four days, when the kousso was administred on an empty stomach, which in the course of the day brought away a large worm. Its head could not be detected, but the the narrow portions which seemed to have been joined to it came away. During the same and following day, there was considerable diuresis, but afterwards the urine became scanty. The motions were loose and dark. Her general state improved, and she left the hospital apparently cured.

The next patient was also a woman, aged about fourty-four, who had apparently got the worm at Fort Beaufort, in the Cape of Good Hope, at which place she resided some time. She began to pass joints on the year following that on which she went to that place. Worms are very common among the natives, who are in the habit of taking infusion of pomegranate bark, turpentine, and also a scraped root, called "Caeay." Of all the remedies which she has used, the pomegranate was the most effectual, which however has not cured her, as she continues to pass joints. Her symptoms are gnawing pain, and constant feeling of sinking in the epigastrium, pain in limbs, general lassitude, dimness of sight, loss of appetite, short dry cough, and a sensation as of the movement of the tænia. She took kousso as the other patient; it was followed by slight nausea for a quarter of an hour. Its taste, she says, is very much like pomegranate. A tapeworm, of a very large size, was passed four hours ane a half afterwards, and subsequently some isolated joints. The head could not be found; but there is no doubt that it came away, on account of the narrowness of some of the pieces. During the same and two following days, numerous joints, apparently long dead and partially decayed were passed.

The other was a delicate, anæmic-looking woman, who had the usual symptoms of tapeworm for some time; but did not, to her knowledge, pass any until three weeks, and again one week ago. Is a native of Norfork; but has latterly resided in Soho, which neighbourhood is supplied with water by the New River Company. She had the kousso exhibited in the same way, followed by a dose of carbonate and sulphate of magnesia. A portion of worm passed with every motion. Both these patients have left the hospital improved in health, and apparently free from any symptom of tænia.—*Med. Times, April* 20, 1850, *p.* 296.

63.—OBSERVATIONS ON VERMIFUGE MEDICINES.—By Dr. Cazin.

Dr. Cazin, of Boulogne-sur-Mer, having had the opportunity of treating a large number of worm cases, has published the following interesting account of his experience. He states that he has frequently employed the common *spigelia* or *worm-grass*. He administers it in the form of decoction, prepared by boiling two drachms of the herb in a quart of water to one-half. The decoction is then expressed, strained, and flavoured with a little lemon-juice and a sufficient quantity of sugar. The dose for an adult is two wine glassfuls, followed by a wine-glassful every six hours until the desired effect is produced. To children and delicate persons a smaller quantity is to be given.

Wormwood (absinthium) is an excelent indigenous anthelmintic; it is also a powerful tonic and stimulant, the use of which, continued after the expulsion of the worms, prevents their reproduction. M. Cazin often uses a wine prepared by digesting an ounce of wormwood, with an equal quantity of garlic, in a bottle of white wine, of which he gives from one to three ounces every morning. This wine is well-adapted for poor lymphatic subjects, wasted by wretchedness, and suffering from the influence of a marshy soil. The absinthium maritimum is likewise a very good anthelmintic. M. Cazin gives it to the extent of one or two drachms boiled in four or five ounces of water, with the addition of some white sugar, or of any anthelmintic syrup. This is quite a popular remedy in the maritime districts, and almost always succeeds with children affected with worms.

Although a case of poisoning by *cevadilla* has been reported, M. Cazin has administered this vermifuge with success in cases in which ordinary anthelmintics had but little effect; but he has always commenced with a very small dose, in order to ascertain how far it would be borne by the digestive organs. For children the dose of this plant is from a grain and a half to four or five grains of the powder of the seeds, mixed with syrup of rhubarb; for adults eight or nine grains, with the addition of a little sugar and a few drops of oil of fennel. In each case the dose is to be repeated daily for four days, after which the infusion of camomile is to be given.

Assafœtida possesses acknowledged anthelmintic properties, and is suitable for cases of sympathetic nervous affections produced by the existence of worms. It thus, like valerian, fulfils a twofold indication. In a case of nervous affection, which M. Cazin believed to be idiopathic, the administration of assafœtida both determined the disease and revealed its true cause, by effecting the expulsion of a number of lumbrici. This result has in three cases of chorea and in two of epilepsy, enabled him to recognise that sympathetic irritation, depending on the presence of intestinal worms, was the sole cause of disease in these instances. Under ordinary circumstances M. Cazin frequently combines assafœtida with calomel in pills. This combination, of all those that he has employed, succeeds best in expelling lumbrici. He has also combined it with black oxide of iron, particularly in anemic patients. Assafœtida may be given in powder, in doses of from four grains to half a drachm.

The essential oil of *turpentine* is not merely useful in cases of tænia, it is also decidedly efficacious in expelling the lumbrici. M. Cazin has sometimes, in cases of lumbrici and ascarides, administered with advantage turpentine enemata, prepared by supending, by means of yolk of egg, from one drachm to half an ounce of the oil in decoction of tansy, absinthium, worm-seed (semen-contra,) or Corsican moss.

Common salt is very destructive to worms; it is given alone in large doses dissolved in water, it should be taken on an empty stomach. M. Cazin also frequently administers it in the form ot enema, with brown sugar, linseed or poppy oil, and a sufficient quantity of water. With children it almost always succeeds.

Like all tonics, *iron* has the advantage of destroying worms, at the same time that, by imparting tone to the intestines, it prevents their reproduction. From six to eight grains of ironfilings, mixed with an equal quantity of rhubarb, and taken two or three times a day, have often been sufficient to expel the worms contained in the intestines.

M. Cazin succeeded in rapidly curing a boy nine years of age, emaciated and pale, whose sleep was disturbed, and who was suffering from spasmodic movements similar to those which characterized chorea, by the exhibition of pills of sulphate of iron, combined, according to Puller's formula, with aloes, senna, &c., under which treatment he voided twenty-three lumbrici in four days. He has also used with remarkable success Bosen's mixture, containing extract of black hellebore and sulphate of iron. But what he chiefly gives to children, as well as to adults, is the syrup of citrate of iron (four parts of citrate to sixty of simple syrup, and one of essence of lemon,) in doses of from two drachms to half an ounce to children, and from half an ounce to two ounces to adults.

M. Cazin remarks that *calomel*, so efficacious as an anthelmintic, ought never to be combined with an alkaline chloride, as the formation of corrosive sublimate would probably ensue from their admixture. In like manner, the combination of calomel with cherry-laurel water, or emulsion of bitter almonds, would give rise to the development of two formidable poisons, corrosive sublimate and cyanide of mercury.

The effects of the *male fern*, *tin*, *pomegranate bark*, *hellebore*, &c., require merely to be noticed; and the properties of the pomegranate root bark are so well known that they need not be dwelt upon. M. Cazin has remarked nothing particular respecting other anthelmintics. He merely says that *cod-liver oil* has succeeded with him in the cases of two females, one of whom passed twelve lumbrici the same day that she had taken in the morning three table-spoonfuls at intervals of an hour.

But whatever be the medicine selected, we must not, like routine practitioners, be content when the worms are killed and dislodged, with this merely palliative cure. A very important indication remains to be fulfilled, viz. to prevent their reproduction. This object is attained, according to M. Cazin, by the adoption of a tonic and stimulant regimen, which must be long continued, and, above all, by the employment of bitter and chalybeate preparations. He has found the ferruginous chocolate to be sufficient, in the case of children, to prevent the relapses which are for many years very apt to occur. Wine taken while fasting has succeeded with the poor inhabitants of the marshes, accustomed to live only on vegetables and milk; and he has also remarked its efficacy as a preventive of worm affections in other instances.

To these observations of M. Cazin, the Editor of the 'Journal de Médécine,' has appended the following practical remarks. The number of experiments tried by M. Cazin leaves no room for doubt respecting the enormous amount of worm affections which he must have ment with. Such a result may appear strange to Parisian physicians, who attribute to the presence of worms in the intestines only a very trifling influence over the symptoms formerly ascribed to them. But if worm affections are rare among the inhabitants of large towns, they are frequent and generally more serious among the peasantry, and particularly among those who are poor and placed in unfavorable hygienic circumstances. We shall, therefore, take the present opportunity of mentioning the efficacy of *brown santonine*, lately brought under the notice of the readers of the 'Bulletin de Thérapeutique,' by M. Gaffard, an apothecary at Aurillac.

The difficulty experienced in procuring pure santonine, both on account of its high price, and for other reasons, has induced M. Gaffard to endeavour to obtain from *worm-seed* a product which may possess the advantages of the former, and at the same time be free from the objections to the use of the latter. This product he calls brown or impure santonine; it is obtained in the following manner:

Take of Aleppo worm-seed, three ounces; carbonate of potash, one ounce; slacked lime, sifted, half an ounce; water, from three pints to three pints and a half. Place the mixture on the fire, stirring occasionally with a wooden spatula; let it boil for an hour; on removing it from the fire pass it with expression through a linen cloth, let it settle, decant, and add hydrochloric or nitric acid until it reddens litmus without being sensibly acid to the tongue. Allow it to rest, pass it through a filter previously moistened, or through a piece of close canvass, and allow the product which remains on the filter to dry in the open air until it acquires the consistence of firm butter. This product, which is a mixture of santonine, resin, and essential oil, will answer for the various pharmaceutic forms in which the practitioner may wish to exhibit it. M. Gaffard gives it in the form of lozenges composed as follows:

Brown santonine, three drachms; powdered sugar, thirteen ounces; powdered gum, one ounce and a half; essential oil of lemon, twenty-five drops. Place the brown santonine in a marble mortar; add by degrees, and with constant trituration, the sugar mixed with the essential oil and the gum, so as to make a homogeneous powder. Form with a sufficient quantity of water a mass of the desired consistence, and divide it into lozenges, each of which shall weigh, when dried, fifteen grains; each lozenge will then contain somewhat more than one-third of a grain of brown santonine.

For infants under six months, the dose will be one lozenge night and morning; from six months to a year, two lozenges night and morning; from one to two years, three, and from two to four years, four, night and morning; for children of five years and upwards a lozenge for each year of the child's age should be given night and morning. The medicine to be continued until the desired effects are produced.—(Journal de Méd.)—*Dublin Quart. Journal*, *May* 1850, *p.* 489.

64.—ON THE TREATMENT OF CONSTIPATION BY ELECTRO-GALVANISM.

By Dr. W. Cumming, Edinburgh.

It is perhaps a bold assertion that few cases of constipation will resist the action of electro-galvanism; but the number of cases of various kinds in which I have used it with success, leads me to infer that in all, except those arising from organic or mechanical causes, this agent will not only act as an aperient, but give such tone to the muscular and mucous tunics, as in time will lead to the natural discharge of their functions.

The use of galvanism has been too extensively limited to paralysed organs. The same influence that will restore vigor either entirely or partially to a muscle or to a set of muscles that have lost their power, will obviously under due regulation, impart it to those in which it is diminished; and probably few will question that the muscular fibres or the intestinal canal have a function to perform not the least important of the various portions of that tube: that in torpor of the bowels they are practically partially paralysed; and that therefore we might *a priori* expect that galvanism, by supplying an appropriate stimulus, first directly, and then secondarily by its probable action on the sympathetic system, would have a beneficial operation. If this be true (and if not theoretically, I am satisfied that it is practically so), what innumerable wretched symptoms and feelings may not be removed, to which so many of both sexes are victims, and which all medical practitioners have daily to contend against as the accompaniments and consequences of *habitual constipation!—Med. Gazette, Dec.* 7, 1849, *p.* 972.

45. ON THE TREATMENT OF DIARRHŒA BY OIL OF TURPENTINE.—By Dr. J. J. Trayer, Queen's County, Ireland.

[Dr. Trayer speaks very highly of this medicine, which he used extensively in the diarrhœa which prevailed in his locality, at the time when cholera was so prevalent in other parts of the island. The disease was marked by very sudden invasion, after exposure to cold, or the indigestion of some noxious article of diet; the stools were fluid, often tinged with blood, very frequent and exhausting; there was very little abdominal pain, but distressing pain and sense of fatigue in the loins and lower extemities; and there was frequent vometing. With respect to the treatment, Dr. Trayer says:]

The medicine which I use as a sheet anchor in these cases is the rectified spirit of turpentine, in small doses (from 5 to 20 minims), repeated more or less frequently, and variously combined as the circumstances of the case demand; the most usual combination being the tincture of opium.

In a case of average intensity, my mode of proceeding is this:—If my patient is still up I order him at once to bed, and apply a light, but large bran poultice, moistened with infusion of cammoile, and occasionally sprinkled with laudanum, over the abdomen. This being covered with oiled silk maintains its warmth and moisture for a long time. A large piece of patent epithem is an admirable substitute when it can be obtained. Warm jars placed to the feet, a liberal supply of bed-clothes, and a warm, but not close atmosphere in the bed-room, render great assistance.

As soon as it can be obtained (I generally carry it with me), a dose of spirit. terebinth., about ♏xv., is given, combined with laudanum; or if this be for any reason contra-indicated, an equivalent of some other sedative (hyoscyamus, e. g.); or sometimes without any other medicament. This dose is felt almost immediately to check the disease; and here if I were to describe my own feelings, the aptest expression I could use is, that a message seems, as by electric telegraph, to be conveyed on the moment to the whole canal, that the discharges are to cease. In place of the sickly nausea, of the coldness and sensation of incessant movements of the bowels, which tell you that your serum is oozing out, a feeling of warmth and cheerful tone at once pervades the system, and tells you that the disease is checked: in fact, this first or second dose, would generally complete the cure if the patient would remain in bed a few hours, and for a day or two observe a strict dietary. If the process be not always so speedy, still, perseverance in the use of these measures has as yet succeeded in every case in which I have tried them, with one exception.

I should here mention what I have found the easiest way of taking the rather disagreeable medicine I propose.

Having prepared the tincture of hops with some fine French brandy I put in a wine glass about a drachm of this tincture. I drop in the spirit of turpentine, which floats on its surface. Then, just as the patient is going to drink it off, half an ounce of cold spring water being added, the turpentine is so engaged in the molecular movements that occur, while the spirit and water are mixing, as to disappear. At this moment the draught is easily swallowed; and if care be taken not to wet the lips, its flavor very soon passes off. After a few seconds the turpentine again floats, and if left for some hours, the mixture becomes troubled and milky, and is not easily taken. Each dose should, then, be dropped out as it is required.—*Med. Gazette*, *Nov.* 23, 1849, *p.* 882.

66.—ON VARIOUS FORMS OF INFANTILE DIARRHŒA.—By M. TROUSSEAU.

Besides lientery, there are several forms of diarrhœa which affect infants, and with the nature of which it is important to become acquainted. *Bilious diarrhœa* is characterized by bilious mossy stools of the color of oil. There is also a modified form of bilious diarrhœa, in which the stools resemble chopped vegetables. There is the appearance of the debris of spinage in the stools, which are also spotted with a liquid of the color of sulphate of copper. This modification of billious diarrhœa is very common in new-born children, but becomes more rare as age advances. *Mucous* or *glairy diarrhœa* is characterized by the resemblance of stools to slightly boiled white of egg. This is sometimes combined with ordinary bilious matter, and more rarely with food: sometimes also blood is present. This form is commonly attended with pain, but is fortunately more amenable to treatment than the others. It appears to be confined to the large intestines. In *pseudo-membranous diarrhœa* the stools are imperfectly moulded, and covered with a pseudo-membranous concretion of thickened mucus or fibrin. The most severe form of all, exclusive even of epidemic conditions, is the *purely serous*, *watery*, or *choleriform diarrhœa*, or *infantile cholera*, which is very common in infants at the breast.

The following is an abstract of the opinions of M. Trousseau on the symptoms of each of these froms of diarrhœa.

In *bilious diarrhœa*, the stools are yellow and abundant, and almost always accompanied with bilious vomiting, with more or less intense fever, and increase of the biliary and pancreatic secretion. It is more manageable than lientery, and yields to remedies in children as well as in adults. It is a remarkable fact, that if the diarrhœa be very abundant, the vomiting ceases; but if, on the other hand, the diarrhœa is abruptly suspended, the vomiting immediately returns. This is especially remarkable in children, and is considered by M. Trosseau to have an important bearing on the treatment. When the stools are yellow, the patient is not severly ill; but when they are copious and green, and there is fever, the prognosis is more unfavourable. The *glairy diarrhœa* commonly depends on inflammation of the large or small intestines. There are cholic and fever, but rarely vomiting. The functions of digestion and assimilation still go on to some extent. The pseudo-membranous secretions are extremely rare as a result of inflammation of the large intestines, but are most commonly observed after enteritis. In *choleroid diarrhœa*, which is the most severe form, after one, two, or three days of bilious diarrhœa, the children are suddenly seized, more frequently in summer than in winter, with irrestrainable vomiting, and with serous dejections, which scarcely colour the linen cloths green. At the same time, the child utters constant cries; the eyes are hollow, the respiration impeded, the abdomen is drawn in, and the skin assumes a blue tint, and the patient dies. M. Trousseau does not hesitate to affirm, that this disease kills more than one-half of the children at the breast, for it is at this age that it is principally observed. It rages independently of an epidemic of cholera, from the age of one to two years—that is to say, during the first dentition, and attacks few children who have been weaned for some time.

Treatment.—In bilious diarrhœa, the first remedy to be given is ipecacuanha, in emetic doses, of fifty centigrammes to a child at the breast, a gramme to older children, and two grammes to adults. It is given three days in succession, and commonly modifies the vomiting, diarrhœa, and fever. If it fails, ten centigrammes of sulphate of copper may be given, in four doses, at intervals of ten minutes, dissolved in water. This has produced astonishing results in three children. In one child, who had been labouring under vomiting and copious diarrhœa for three days, the number of stools was reduced from ten to three by the administration of sulphate of copper. In a second, it succeeded, after the failure of bismuth and saline purgatives. In a third child, who was labouring under morbillar pneumonia, which was treated by antimonials and digitalis, diarrhœa was arrested by sulphate of copper. Rochelle salt, sulphate of magnesia, or magnesia alone, or combined with calomel, are useful in such cases. It is good practice, for instance, to give five centigrammes of calomel in the evening, and twenty-five or thirty centigrammes of magnesia the next morning.

The green form of diarrhœa is equally well combated by the preceding means, but especially by saline purgatives, as the potassio-tartrate of soda. If, however, the stools remain green at the end of two or three days, it will be found advantageous to administer twenty-five or thirty centigrammes of magnesia, with an equal quantity of sugar, at the same time applying cataplasms to the abdomen, and administering enemata. In case of failure of these means, emetics may be employed.

In glairy diarrhœa, if there be no vomiting nor flatulent distension, the treatment may consist of injections. If the pain be severe, an injection consisting of from five to ten centigrammes of nitrate of silver in two or three hundred grammes of distilled water, should be administered. When returned, it is immediately followed by a similar one, containing a drop of laudanum. This is repeated once a day for three or four days, according to the amount of glairy mucus and blood in the stools. When there are flatulent distension and fever, it is well to commence the treatment with ipecacuanha, then to give Rochelle salts, and afterwards to employ lavements, and not to give opium till there be no more vomiting. The injections may contain sulphate of copper or of zinc, the quantities being double that of nitrate of silver. It is rare, says M. Trousseau, that acute colitis will not yield to this treatment: sulphate of copper is almost as active, and quite as excellent, as nitrate of silver.

Pseudo-membranous diarrhœa is rare in children, but common in adults, especially in constipated females. It yields readily to enemata of nitrate of silver, or sulphate of zinc or copper, and to belladonna given internally. Children affected with this disease appear to void boiled rice, the stools containing the fibrinous productions developed on the surface of the intestinal excoriations which are seated either in the rectum or the colon. It is treated as in adults: calomel may also be administered in the form of enema, by triturating one or two grammes with a thick solution of gum, and injecting it every one or two days.

The most severe form is *infantile cholera.* A child after it has been weaned, or while it is suckling, or during dentition, has diarrhœa: this is considered *salutary* by the nurses, and by medical men, who misinterpret the saying of Sydenham, that a child's bowels should be open during dentition. This is a grave error, which should be guarded against. If the diarrhœa lasts one or two days, it may be let alone; but if it continue beyond that time, it must be moderated and arrested. If this be not done, a child may have diarrhœa for ten days, a fortnight, or a month, without any constitutional disturbance; on a sudden, it is siezed with violent vomiting and abundant serous diarrhœa, the eyes become hollow, the skin blue, the tongue cold, the pulse small, and the muscles frequently soft and flaccid like rags. The vomited matters are greenish, generally with a copper colour; the diarrhœa is so completely watery in most cases, that the linens seemed wetted with urine; in other cases they seem as if dipped in a solution of copper. The child utters continual cries, and is restless and sleepless. Sometimes the diarrhœa stops, and the vomiting becomes violent; at others, the diarrhœa and vomiting are partially suspended, but not entirely arrested; the child soon loses strength, and dies. This disease lasts from twelve hours to five or six days, but the most common duration is from twenty-four to forty-eight hours.

The first remedy which presents itself is opium. In this, M. Trosseau has very little confidence. It may arrest diarrhœa, but the vomiting continues; if the opium be given by mouth, it is more likely to aggravate the vomiting and kill the patient, than to cure him. Astringents, such as monesia, rhatany, bistort, tormentilla, cinchona in draught and in injection, etc., are of no use in this form of diarrhœa.

The only treatment on which M. Trousseau depends, is based on emetics and purgatives. As an emetic, powdered ipecacuanha is the best; among purgatives, the potassio-tartrate of soda, in doses of four, five, or ten grammes, is to be preferred. But in the proper choleraic form, we must at once use mustard baths. The child must be kept in the bath until the hands of the person holding it are attacked with an insupportable smarting; it is then wrapped in woollen cloths, and at the same time has administered to it a little syrup of ether, with mint and Seltzer water. When moderate reaction has set in, we may advantageously give ipecacuanha and Rochelle salts, to modify the condition of the alimentary canal. If at the end of forty-eight hours, there be heat, slight stupor, and other typhoid symptoms, and the diarrhœa continue at the same time, M. Trousseau gives a mixture, containing one centigramme of nitrate of silver, with thirty grammes of distilled water and twenty grammes of syrup; and injects twice or thrice daily, an enema containing from five to ten cenitgrammes of nitrate of silver in two hundred grammes of distilled water. The mustard bath is continued, if required. When the nervous or typhoid symptoms are inclined to be obstinate, the infant might be plunged in a cold bath for one or two minutes, or have a slight cold affusion. These means, aided by refreshing drinks of milk or beef-tea, often put an end to the disease. We see, then, that in indigenous cholera, the indications are almost the same as in epidemic cholera. Nevertheless, whatever is done, the greater number of children die, even after they are thought to be recovering. Two or three drops of laudanum may arrest the vomiting and diarrhœa; but let no one trust to this. As long as the pulse is small, a[illegible]ere are slight fever, restlessness, cries, etc., the condition of the child [illegible]carious, even though the vomiting and diarrhœa have been arrested. The most favourable signs are the return of a gentle heat to the skin, and the diminution of restlessness; because these symptoms indicate, even though the diarrhœa persist, and that there is nothing left but ordinary enteritis. (Journal de Méd. et de Chir. Prat., 1849, p. 535.)—*London Journal*, *Feb.*, 1850, *p.* 187.

DISEASES OF THE URINARY ORGANS.

67.—ON THE ACIDITY OF THE URINE.—By Dr. H. Bence Jones, F. R. S., Physician to St. George's Hospital.

From experiments, it appears that immediately before each meal the urine showed the highest degree of acidity; and the water passed two, three, or more hours, after food, always showed a lower degree of acidity. The decrease was greatest three hours after breakfast, and five or six hours after dinner, when it reached the lowest point. The acidity of the urine then increased, until immediately before food, when it again reached the highest limit. If no food was taken, the acidity of the urine did not decrease, but remained nearly at the same degree of acidity for twelve hours, but then, directly after food was taken, the acidity fell.

When animal food only was taken, the diminution of the acidity after food was more marked and more lasting than when a mixed diet was taken. The increase of acidity before food was hardly so great as when mixed diet was taken.

When vegetable food only was taken, the decrease in acidity was not so great as when animal food was taken—that is, though the urine became neutral after food, it did not become highly alkaline. The increase in the acidity of the urine was higher before vegetable food than it was before animal food was taken.

Dilute sulphuric acid was taken in large doses, but it did not produce a very decided effect. Nine drachms of dilute sulphuric acid in three days slightly diminished the decrease in the acidity of the urine after food; but the acidity before food was very slightly, if at all increased thereby.

By comparing the acidity of the whole quantity of urine passed in twenty-four hours for three days when no sulphuric acid was taken, with the acidity when nine drachms of dilute sulphuric acid were taken during three other days, the increase in the acidity, though not very marked, was decidedly apparent. The average quantity of carbonate of soda required to neutralise the whole of the urine made in twenty-four hours, when no sulphuric acid was taken, was 15.39 grains. The average quantity required when sulphuric acid was taken, was 20.38 grains. There was but little difference in the quantity of urine made.

Tartaric acid, in large doses, produced a decided effect on the acidity of the urine. 354 grains of dry and pure tartaric acid, taken in three days, increased the acidity of the urine; but in that time it did not render the effect of digestion on the reaction of the urine less apparent than it was when no acid was taken.

Liquor potassæ, in large doses, produced a decided effect in diminishing the acidity of the urine; but it by no means renders the urine constantly and permanently alkaline. Its effect seems to pass away rapidly.

An ounce of strong liquor potassæ, taken in three days, did not counteract or conceal the influence of digestion on the reaction of the urine.

Tartrate of potash produced a most decided and rapid effect on the acidity of the urine; 120 grains of pure dry tartrate of potash, dissolved in four ounces of distilled water, made the urine alkaline in thirty-five minutes.—

In two hours the alkalescence had disappeared; but after the next meal, the effect of the tartrate of potash was again apparent. Ten drachms of tartrate of potash, in three days, produced but little, if any effect on the acidity of the urine after it had been omitted for twenty-four hours.

The result of these experiments is, that the acidity of the urine is always changing, and that the changes depend on the state of the stomach. Whilst much acid is in the stomach, the acidity of the urine is for that time diminished. As the acid returns from the stomach, the acidity of the urine is increased, and usually it reaches its highest limit before food is again taken.

Animal food causes a greater oscillation than vegetable food does, and when no food is taken, the variation is very slight.

The influence of animal food in lessening the acidity of the urine, and the influence of vegetable food in increasing the acidity, are in remarkable contrast. Possibly the effect of oil, starch, and sugar on the acidity of the urine may be separated, and the influence of each may be proved. That these three substances, after they are taken into the stomach, probably pass through various neutral and acid states before they become carbonic acid and water, I have already mentioned to you. The urine may from these substances receive many acids which, when animal food alone is taken, may be altogether absent. That vegetable acids partly pass off by the kidneys, the experiments with tartaric acid sufficiently prove.

The variations in the acidity of the urine indicate corresponding variations in the alkalescence of the blood. In both fluids, the variations are unceasing and opposite. I again repeat that this state of alkalescence or acidity of the urine does not depend upon disease, and most probably depends solely upon the irritability of the stomach.

You will probably long since have asked,—What is the acid in the urine? And to this question I cannot yet give you a certain answer. I am not certain that the acidity is always produced by biphosphate of soda, though at present this is the most probable answer that is known. It is probable that there is generally no free acid in the urine, but that the reaction arises from some acid salt; but I am certain that in some instances of strongly acid reaction, the quantity of phosphate of soda has been extremely small, much too small to produce the acidity, which was very decided.

The nature of the acid is not of great consequence, but the variations in the acidity of the urine in health give practical results of importance. For if you find that the urine passed at one hour of the day is highly acid, you may find that the water made at another hour of the same day is nearly or quite alkaline; and if you are tempted to prescribe alkalies for the highly acid reaction of the urine made long after food, you may be led to prescribe acids for the alkaline reaction of the urine made soon after food. Thus, according as you may see your patient early or late, he may be put on a course of caustic potash or nitro-muriatic acid.

The reaction of test paper on urine made at any one hour of the day should never determine the use of acid or alkaline medicines. The different deposits which take place in the urine are far better tests of the state of the urine, and of the necessity for these remedies. If you are guided by the reaction of test paper, the total quantity of urine made in twenty-four hours must be examined.—*Lancet, Feb.* 9, 1850, *p.* 164.

68.—ON THE RELATION OF THE SPECIFIC GRAVITY OF THE URINE TO ITS SOLID CONTENTS.—By Dr. H. Bence Jones, F. R. S.

Tables have been constructed professing to tell how much solid matter is contained in urine of any specific gravity. It is said, that by taking the specific gravity and referring to the table, the quantity of solid matter may be immediately determined. If the urine were simply a solution of one substance,—as, for example, urea in distilled water,—such tables could be made to give the truth; but when many different substances are dissolved in water, no tables can be trust-worthy. A small quantity of one substance may increase the bulk of the urine more than the larger quantity of another substance, or equal quantities of different substances may increase the bulk of equal quantities of water in which they are dissolved to a very different degree; so that the solid residue in each might be equal, while the specific gravities of the solutions might be different. Experiment proves this in the case of the urine.

[After detailing a number of experiments, Dr. Jones says]

These experiments show that the quantity of solid contents cannot be determined by taking the specific gravity.—*Lancet, Feb.* 9, 1850, *p.* 163.

69.—ON THE DETECTION OF OXALATE OF LIME IN THE URINE.—By Dr. H. Bence Jones, F. R. S.

Oxalate of lime is so frequently found in the urine of those who are in a good state of health, that I do not consider it as indicating any disease, but only a disorder of no serious importance. It scarcely indicates a more serious derangement of the general health than a deposit of urate of ammonia does. It may occasionally be found in the urine of all who lead sedentary lives, taking insufficient air and exercise, and more food than is requisite for the daily wants of the system. I have found it in the urine of those who are free from every complaint. Even in the urine of healthy children it may very frequently be seen. I have met with it in every kind and stage of disease. In the fracture wards of St. George's Hospital I have very frequently found it. The most severe case I ever saw, was an artist, aged thirty, dying of an abdominal aneurism. In cases of indigestion, especially where flatulence occurs; in cases where no indigestion ever was felt: in skin diseases; in cases where the skin never was affected; in cases of acute rheumatism, of acute gout, of fever; in sciatica in a gentleman, seventy-four years old, with spermatorrhœa; and in the diseases of women and children, octohedral crystals occur. So frequently is oxalate of lime mixed with urate of ammonia in sediments and calculi, that I have returned to the conclusions which Dr. Prout originally published in the second edition of his work. After giving some details of twelve cases of oxalic calculus, he says, "We are authorized to draw the following conclusions:—6th. That from the dissection of calculi formerly mentioned, it appears that the oxalate-of-lime of diathesis is preceded and followed by the lithic acid diathesis—a circumstance which seems to be peculiar to these two forms of deposit, and when taken in conjunction with the other circumstances already related, appears to show that they are of the same general nature, or, in other words, that the oxalic acid merely takes the place, as it were, of the lithic acid, and by combining with the lime naturally existing in the urine, forms the concretion in question. 7th. (Dr. Prout continues:) The diathesis being of a similar nature, the principles of treatment adapted for counteracting the original tendency to it must be also similar." And, as a medicine, muriatic acid was used to change the diathesis from the oxalate of lime to the lithic acid.

I find that the two deposits together may be met with daily on careful examination, by the microscope, of the urine in different cases of disease; and if the examination is made at different hours of the same day on a case in which oxalate of lime occurs, we shall not unfrequently find three hours after food, instead of urate of ammonia being mixed with the oxalate of lime, there is phosphate of lime and oxalate, and no urate of ammonia. Thus at one hour we may find oxalate of lime alone; at another, oxalate of lime with urate of ammonia; and at a third examination, oxalate of lime and phosphate of lime, or phosphate of lime only; the variations in the acidity of the urine being the chief cause of the differences in the deposit.

Oxalate of lime is so insoluble in distilled water that it might well be considered to be insoluble in the urine. Its occurrence in the form of crystals shows, however, that it cannot be insoluble; for crystalline form implies deposit from solution. Careful observation of the urine also shows that the oxalate of lime is soluble therein.

A medical man, in very tolerable health, aged fifty-nine, passed about a drachm of water at half-past ten in the morning, saying that he had a good deal of irritation. I examined it immediately. It was acid, and had a slight cloudiness. Under the microscope I saw many globules, like mucus, some of them slightly serrated. I saw some dead perfectly-formed spermatozoa, and a great many particles looking like the bodies of spermatozoa, tail-less—that is, slightly triangular and highly refracting. I looked most carefully for oxalate of lime, expecting to find it; but I could not find a single crystal anywhere, and no urate of ammonia was to be seen. At nine the following morning I again looked at the drachm of urine. There was a very transparent cloudy sediment, like mucus, only more transparent, occupying nearly one fourth of the liquid in height. On examining a drop, myriads of small crystals of oxalate of lime were seen, and not a particle of urate of ammonia or uric acid.

I had for some time passed over similar observations, by supposing that my first observation had not been made with sufficient care, but from the above, and other cases that have since occurred to me, I am certain that it sometimes requires many hours for the oxalate of lime to crystalize out.

You cannot say that no oxalate of lime exists in any urine until at least twenty-four hours have elapsed from the time of the passing of the water. "It requires no skill and no preparation of the urine to find the oxalate of lime. The urine should be left to stand for twenty-four hours in a bottle, or tall glass; the upper part of the fluid should be poured off, and the last few drops remaining in the glass or bottle should be examined. A magnifying power of 320 times is generally sufficient, but the crystals are sometimes so small, that twice this power is necessary to determine the form. Generally oxalate-of-lime octahedra are thus found without the least difficulty, sometimes in large single crystals, very frequently in aggregations of small octahedra, forming microscopic calculi. Dr. Golding Bird was the first observor who stated that these crystals, which had for some time previously been observed in urine, were oxalate of lime. The chemical proof is difficult, if not impossible, to obtain, for the octahedral crystals are rarely present in sufficient quantity to admit of perfect examination.—*Lancet, Feb.* 23, 1850, *p.* 225.

70.—OBSERVATIONS ON DIABETES.—By Dr. H. Bence Jones, F.R.S.

The excretion of sugar by the kidneys constitutes the disease which is called diabetes. The amount of sugar in the urine is frequently less than is met with in milk; but the important point with the medical man is the determination of the presence of the sugar and not the quantity in which it exists. The proof of the existence of sugar in the urine is of primary importance: the question of how much sugar is comparatively of very litle consequence. Hence the tests for the sugar in the urine are of more value than the methods of making quantitative analysis of it.

All the tests depend on the facility with which the composition of the sugar is changed. For the medical man the most valuable test is the action of some metallic oxides, aided by heat and alkali, on the elements of the sugar. Oxide of copper and oxide of silver are the most worthy of your attention.

To a drachm of suspected urine, add two or three drops of a saturated solution of sulphate of copper, and then two drachms of caustic potash; the hydrated oxyde of copper, which first is precipitated, re-dissolves if sugar or many other organic substances are present, becoming of an intense blue, and when heat is applied, if grape sugar be present, the oxide of copper is rapidly reduced, and reddish-yellow sub-oxide of copper is precipitated.

The reduction of the oxide of copper is effected by the carbon of the sugar.

If cane sugar instead of grape sugar be used for this experiment, the rapid reduction of the oxide to the suboxide will not take place; the bright blue solution will be formed, but the heat must be very long continued to effect the reduction; uric acid and albumen will also effect a slow reduction of the oxide of copper. You will from this see that it is the rapidity with which the grape sugar is decomposed which constitutes the test. It is always well to repeat the experiment, if it be an unsuccessful trial, with more or less sulphate of copper than was used in the first experiment. If very little sugar is present, too much sulphate of copper hinders the reaction from being clearly seen; if very much sugar is present, the reaction will come out more distinctly by adding more sulphate of copper.

The reduction of oxide of silver by grape sugar and cane sugar is beautiful, and though not quite so easy a test as the oxide of copper test for diabetes, yet it may be often used as an additional proof where any doubt exists. A saturated solution of nitrate of silver is made—a few drops of this are to be placed in a test tube, and a single drop of caustic ammonia is to be added; if a brownish oxide of silver falls a single drop of the suspected urine is to be added, and the test-tube is then to be heated, and the contents to be well shaken. In a few seconds the sides of the tube will be coated with silver, and the metallic lustre will be seen. The carbon of the sugar has taken the oxygen from the oxide of silver. Carbonic acid and metallic silver have been produced.

Potash alone decomposes grape sugar, and so it has been used as a test of diabetes. When heat is applied to urine containing grape sugar and liquor potassæ, the sugar is decomposed into fomic, sacchulmic, melassic acids, and thence a great change in color results; no precipitate forms, and on this account the test ought not solely to be relied on, as some deepening of color may ensue when no sugar is in the urine. Fermentation by means of yeast, is the oldest and surest evidence of the presence of sugar, and by this means the quantity of sugar present is best determined, either by the loss of carbonic acid, or by determination of the quantity of alcohol produced.

Another easy and satisfactory test is the appearance of the residue of the urine after a drop is evaporated on a slip of glass to perfect dryness. This can be done rapidly over sulphuric acid, by placing a slip of glass on a small capsule of strong sulphuric acid, and covering the whole with a bason. When dry, granular specks are seen, which, if examined by the microscope, appear to be tufts of crystals, most probably a compound of urea and sugar. If the atmosphere is very moist, these crystalline granules rapidly deliquesce. If by two or more of these tests the presence of sugar is established, it is not necessary to make any quantitative analysis; for the medical man a sufficiently near approximation is obtained by taking the specific gravity of the urine. It is not even necessary to refer to Dr. Henry's tables, in which he gives the solid contents of diabetic urine of all specific gravities. All the information you can use you will obtain by comparing, from day to day, or from week to week, the specific gravity and the total quantity of urine passed in twenty-four hours. The specific gravity will rise or fall according as the sugar is increased or diminished, if the quantity of water is fixed.

If the urine contains albumen also, the test for sugar is more uncertain, and it can in doubtful cases only be made sure by evaporating the urine to perfect dryness, reducing it to a fine powder, and treating it with boiling water, and then filtering it. The sugar is dissolved, the albumen remains undissolved. In the 26th volume of the 'Medico-Chirurgical Transactions' you will see that sugar may thus be detected in the serum of the blood.

Now, regarding the frequency of the occurrence of diabetes, it is by no means so rare as has been said; the delicate tests that we possess will discover it to be a not unfrequent disease long before the ordinary symptoms of the complaint appear. Most of the cases at present recorded or observed, are those in which the disease has been fully formed; and yet, from Dr. Prout's great experience, we can see that such cases are very frequent. In the edition of

1821, Dr. Prout gives no cases of his own.

1825, twenty cases; the average of four years was five cases a year.

1840, no statement is made.

1843, five hundred cases; the average of eighteen years was twenty-seven cases a year.

1848, seven hundred cases; the average of five years was forty cases a year.

In all these cases the disease was probably fully established, and hence perhaps the statement as to the incurability of the disease. So far as can be discovered, there is no organic disease which renders cure impossible. Extreme disorder of functions is all that can be made out. Altered chemical action constitutes the disease, and yet chemical investigations have not enabled us to discover the remedy. One cause of this is, that at present the theory of the disease is unknown. I shall attempt to show you the present state of our knowledge on this question, and give you the explanation of the disease, which at present appears to me most probable.

In my lecture on Digestion, I traced the course of a grain of starch, in its chemical changes, passing through dextrin, sugar, and vegetable acid to carbonic acid. The greater portion of the starch we take passes into dextrin; all the dextrin becomes sugar, and all the sugar is converted into vegetable acid previous to its being oxidized into carbonic acid. The changes which occur in health may be represented by the following series: starch, dextrin, sugar, vegetable acid, carbonic acid. There may be many intervening terms in this series, but these are sufficient to show the direction and nature of the chemical changes which occur in the body.

The disease—diabetes, I consider arises from the arrest or stoppage of these healthy and necessary changes. The series of changes is stopped at the sugar; from some cause the conversion of the sugar into vegetable acid and carbonic acid does not take place, and the whole series of changes may be indicated by the terms starch, dextrin, and sugar.*

When speaking of uric acid crystals in the urine, I pointed out how these were caused by an excess of free acid in the urine, which, reacting on the urate of ammonia, combined with the ammonia, and liberated the uric acid. I have carefully watched some of these cases of excessive acidity of the urine; and I am led to think that there is a peculiar disease, which shows itself by free acid constantly passing off in the urine; and that this disease is nearly related to diabetes. The existence of free acid in the urine and the existence of sugar in the urine, are both results of one cause—the arrest of the chemical changes which, in the state of health, take place in the human body. The changes proceed further in the disease which is characterized by excessive acidity, than in that characterized by sugar in the urine. Thus, in excessive acidity, the series of changes may be represented by starch, dextrin, sugar, and vegetable acid.

We may, then, arrange these diseases, and show their relation to the healthy state, and to each other, thus:—

In health, the changes are, starch, dextrin, sugar, vegetable acid, carbonic acid.

In excessive acidity, starch, dextrin, sugar, vegetable acid.

In diabetes, starch, dextrin, sugar.

I have some reason for thinking that other terms will be found—other stages through which the starch passes in its conversion into carbonic acid and water.

Between dextrin and diabetic sugar another substance has occassionally been met with by good chemists; and as it will add something to the clearness of your view of diabetes, I shall shortly tell you what is known regarding it. You have all probably heard of diabetes insipidus—the term has been applied to all cases in which a large quantity of urine, free from sweet sugar has been passed. The history of diabetes insipidus will show you how incorrectly this term has been used.

In 1806, M. Dupuytren and Thenard, in the 'Annales de Chemie,' vol. lix. p. 41, had a patient making a large quantity of urine, feebly acid, slightly sweet of somewhat saline taste, which, on evaporation, left granules that had scarcely any sweetness. It was concluded that this granular substance contained only a small quantity of sugar. Nitric acid, alcohol, and yeast, had, however, the same action on this substance as on sugar. The conclusion, therefore, was, that though much less sweet than sugar, yet in some way this granular substance was identical with sugar. The patient was kept from all vegetable food, and he was dismissed cured, but he relapsed, the diabetes re-appearing with other diseases, and he died.

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*Though the greater part of the sugar in the urine comes from the starch taken as food, yet the following facts indicate that there is probably another cause also in action in this disease:

1st. When diabetes is fully established, total abstinence from starch and sugar will not entirely stop the appearance of sugar in the urine, although by this means the amount of sugar may be very greatly diminished.

2d. In the milk of carnivorous animals, fed exclusively on meat, sugar of milk, from the researches of Dr. Bensch, ('Annalen de Chemie and Pharmacie,' vol. ii. p. 221,) is invariably present.

3rd. By boiling with water, the livers of animals fed exclusively on flesh, have furnished positive proof of sugar. This fact has now been confirmed by many observers.

Thenard says, in his 'Chemistry,' of this same case, vol iii. p. 177, edit. 1818: 'I have had occasion to extract from the urine of a diabetic patient of M. Dupuytren's fifteen killogrammes (thirty-three pounds) of the nearly tasteless sugar, so little sweet that it might be taken for a kind of gum. It dissolved in water; and when in contact with yeast, ferments as well as the other kind of diabetic sugar does: whence it is evidently a kind of sugar, though a distinct species.'

Bourchardat in the 'Revue Medicale,' June, 1849, writes thus:—

"The division into insipid and sweet diabetes I adopt, without attaching the least importance to it, because the urine of the same patient may contain successively tasteless and sweet sugar. I have examined the urine in three cases which contained tasteless sugar. They presented in a very slight degree, the symptoms of diabetes. Thirst, appetite, and quantity of water, were moderate. If the urine is evaporated over a fire, a black extractive matter, without any of the external characters of sugar remains; but at a lower temperature (140° F.) a clear liquid is obtained, which, at at 68° F. gives crystals of tasteless sugar, capable of undergoing alcoholic fermentation."

He continues,—

"At the commencement of my researches I thought that diabetic urine contained very rarely this variety of crystalline tasteless sugar, but nothing is more common. Most patients with sweet diabetes, who live on animal or vegetable diet, pass urine which contains this tasteless sugar. It crystalyzes exactly like grape sugar. It differs only in its taste, which is perfectly insipid, not only when crystalized, but when in solution; when fermented it gives the same quantity of carbonic acid and alcohol as grape sugar. Alkalies have the same action on it as on grape sugar, blackening it. Acids, when cold, affect no change in it, but if boiled for ten hours in water, acidulated with one-tenth of sulphuric acid, this insipid is changed into sweet sugar, which can be crystalized. The composition is the same as that of sweet diabetic sugar. The insipid and the sweet sugar are two isomeric bodies. I will elsewhere give the details of the analyses.

"It is a curious fact, that this intermediate body, which resembles dextrin in its insipity and property of becoming sweet when boiled with acids, and which differs from dextrin in its crystallization and solubility in alcohol, and in immediatety being capable of undergoing alcoholic fermentation, is a substance which we cannot prepare in the laboratory, and which hitherto has been only made under the influence of organization, in this resembling most closely milk sugar."

Dr. Simon says, (p. 454, German edition), "I once had an opportunity of seeing such sugar in the urine. A young woman with diabetes, eight weeks before her death, was passing a large quantity of very saccharine urine, specific gravity — 1032. The sugar, when separated, had all the properties of grape sugar. She became much weaker, and two days before her death the urine, specific gravity = 1021, was again sent for examination, and I was not a little astonished to find a perfectly tasteless sugar, soluble in hot alcohol; there was mixed with it a considerable quantity of a substance more like gum, which was insoluble in alcohol, and when heated had a peculiar smell."

I have given these details, partly that you may have a clear idea of diabetes insipidus, but still more because it is probable that, by the re-investigation of this insipid sugar, something will be added to the true theory of diabetes. In insipidity this insipid sugar resembles sugar of milk; it differs from it in not giving rise to mucic acid, and in undergoing fermentation

The conversion of the insipid sugar into grape sugar, by the effects of acids, indicates its place in the series of sugars, and it makes it probable that starch, in its passage through the system, undergoes this change also, and thus the whole series at present known will be, starch, dextrin, insipid sugar; sweet sugar, vegetable acid, carbonic acid.

After this account of diabetes insipidus, you will never consider cases of excess of urine as cases of this disease unless you have reason for thinking that tasteless sugar is present. Cases of excess of urine without sugar are well named cases of diuresis. They, for the most part, are produced by excess of liquid being taken—that is, by excessive thirst. M. Becquerel has given us the term of polydipsia. The urine is of very low specific gravity, containing neither insipid nor sweet sugar, not unfrequently containing a small quantity of albumen. The excessive thirst may be caused by excessive dryness of the back of the pharynx, and such cases generally end in extreme emaciation and phthisis. The quantity and specific gravity of the urine immediately determine whether the case is one of diuresis. The symptom of excessive thirst with urine of low specific gravity constitutes the case one of polydipsia.

Torulæ are by no means diagnostic of saccharine urine: but though they form very soon and very plentifully in diabetic urine, yet they may constantly be found in urine which contains no trace of sugar; and though they may lead you to look for sugar, they must never lead you to assert that sugar is certainly present in the urine in which they occur.

A few words regarding the treatment of cases of diabetes.

Why, in diabetes, does the sugar in the blood not pass into the state of vegetable acid, and so on to carbonic acid and water? Why in health does the sugar in the blood rapidly undergo these changes? Our knowledge of the chemistry of the animal system is not sufficient to give as yet any complete answer to these questions. That the alkali in the blood is one of the agents in effecting this change is most probable. The relation of diabetes to acidity points also to the want of alkali. The probable benefit of ammonia and alkaline phosphate of soda lead to the same conjecture. The tendency of the disease being to emaciation and phthsis, gives us at present the best indication for rational treatment.

[Dr. Jones relates the case of a man with diabetes, who was treated with cod-liver oil. He began with half an ounce of the oil and five drops of liquor ammoniæ thrice daily; and the quantity was increased until he took eight ounces of oil and one drachm of liquor ammoniæ daily. When the patient left the hospital his urine was diminished one-half, and its specific gravity one-fourth.]—*Lancet*, *March* 23, 1850, *p*. 349.

71.—NEW TEST FOR SUGAR IN LIQUIDS.

M. E. **Maumene**, (of Rheims,) transmitted a notice of a test issue, which serves to detect the presence of sugar in liquids. Chlorine, the author observes, contrary to the assertion of Liebig, acts on sugar at a temperature of 212° Fah., and even in the cold, after a long period. A brown substance, partly soluble in water, is produced by its dehydrating power. The chlorides, *e. g.* chloride of tin, bichloride of mercury, chloride of antimony, by their affinity for water possess this property in a still greater degree.

A strip of any kind of tissue that is not acted upon by chloride of tin,—*e. g.* white merino—is to be saturated with a strong solution of this salt, and then dried. Thus prepared, the tissue forms a convenient test of the presence of sugar in any liquid. A few drops of a very dilute saccharine fluid placed on the merino, and exposed to a temperature of from 260° to 300° Fahr., will immediately produce a dark brown or black spot.

By the help of this test the presence of sugar in the urine can be readily detected. Ten drops of diabetic urine, the author stated, diffused in half a pint of water, would in this way yield a browninsh black spot. Ordinary urine, urea, and uric acid, produce no results of this kind.—*Med. Gazette, April* 5, 1850, *p.* 604.

72.—ON THE DETECTION OF ALBUMEN IN THE URINE.—By Dr. H. BENCE JONES, F. R. S.

In health, albumen is not a constituent of the urine. Healthy urine, when boiled, never gives a precipitate that is insoluble in a drop or two of nitric acid. I have no doubt that very many of the statements regarding the presence of albumen after food, and in the convalescence from severe diseases, arose from the first half of the test—that is, the effect of heat—being alone employed. The time when the urine is most alkaline, and the earthy phosphates most apt to be precipitated by heat, is often indigestible food, or when the stomach is weak and irritable during convalescence. Up to the time, and even at the commencement of Dr. Bright's researches, heat alone was used as the test of albumen; and Dr. Owen Rees tells me that heat and acid together were first employed by him when making experiments for Dr. Bright.

Albumen is much more soluble in hydrochloric than in nitric acid, and on this account I always prefer the latter acid. Nitric acid without heat is a very delicate test for albumen, and if nitric acid never precipitated anything else, or if albuminous urine were only a solution of albumen in distilled water, nitric acid alone would be a sufficient test; but there are other substances in urine which may be precipitated by nitric acid besides albumen. There may be urate of ammonia, and even urea, present in excess, and the addition of nitric acid may throw down a precipitate of urate of ammonia, or nitrate of urea, and the eye alone cannot, without some practice, see the difference between a precipitate of urate of ammonia, nitrate of urea, and a precipitate of albumen and nitric acid. After precipitation by nitric acid, the effect of heat on the precipitates is very different; the urate of ammonia and nitrate of urea are soluble by heat; the nitrate of albumen in dilute nitric acid, is insoluble when heated; other substances—cubebs, for example, are said to give a precipitate with nitric acid alone. Hence the fallacy of the nitric acid test alone, is, that it may give a precipitate when albumen is absent. I know only of one case in which it gives no precipitate when an albuminous substance is present, and this is not likely to occur. Hence you may take as a rule—if nitric acid gives no precipitate, little or no albumen can be present. I therefore, for quickness, generally try nitric acid first. If no precipitate falls, or forms on standing for a few seconds, I decide against the presence of albumen. If there be a precipitate, I boil the same specimen of urine. If the precipitate be permanent on boiling, I consider the presence of albumen highly probable. Before I decide, I clean the tube, and boil the urine first, and then add a drop or two of nitric acid. The object of cleaning the tube is, to free it perfectly from acid, for a small quantity of acid hinders the coagulation of albumen by heat. Here, as you see, is some urine which coagulates on the addition of heat and acid; on throwing this out of the tube, and adding some more of this urine, without cleaning the tube, you will see that the small quantity of nitric acid which remains will hinder the coagulation of the urine by heat. And now, if I boil the urine no precipitation occurs. I have many times known an unclean test-tube, containing merely a trace of strong acid, lead to the assertion that urine contained no albumen, when a very considerable quantity really was present.

The urine of a patient in St. George's Hospital was highly acid, and gave a precipitate with nitric acid, which was not re-dissolved when heated. This urine would not coagulate with heat alone. I thence concluded that the precipitate with nitric acid was not albumen, nor was it until many months afterwards that I found that very acid urine might contain albumen, and yet not coagulate with heat alone. (See a paper in the 'Medical Gazette' for Nov. 13, 1840, On some Properties of a Combination of Albumen with Acids.) A very small quantity of acid is quite sufficient to stop the appearance of all evidence of albumen, for the compound of the albumen with the acid is soluble in cold and boiling water, though it is quite insoluble in cold or boiling dilute acid. The addition of the acid after the urine is boiled is sure to prevent the albumen from being overlooked. Alkaline urine also, as well as very acid albuminous urine, will not coagulate by heat, for alkalies, volatile or fixed, hinder the coagulation of albumen by heat.

Instead of filling the test-tube with urine, it is well to take about a drachm of urine, filtered, if it be not previously quite clear—that is, if any cloudiness at all is perceptible, the urine ought to be first filtered; then the clear liquid should be boiled for a minute, and afterwards two drops of nitric acid should be added.

If a very great excess of nitric acid is added, (and frequently a volume of nitric acid is added, equal to the bulk of urine.) then the albumen may be re-dissolved, and perhaps this happens more readily if an excess of common salt or other chloride is present, but this solution, in strong acid, is rendered cloudy by the addition of distilled water.

Other tests have been mentioned. A beautiful one is the purple color that albumen forms with sulphate of copper and liquor potassæ. Gelatine, however, gives the same color.

Very strong hydrochloric acid gives a most beautiful blue color, with dry albuminous substances.

A very delicate test is ferrocyanide of potassium, after the urine has been made acid with acetic acid.

The evaporation of a drop of urine on a slip of glass, placed on a water-bath, is also a ready means of detecting the presence of albumen. If any albumen is present, on perfect evaporation, it adheres so firmly to the glass that it is by no means easy to clean it. This evaporation may also be effected in a watch-glass, over a spirit-lamp, in a few seconds, care being taken to hinder the urine from boiling, by holding it far from the flame.

If, by these, or any of them, we satisfy ourselves that albumen exists in the urine, what does it indicate?

The answer to this question is, that, by itself, albumen in the urine indicates only excessive congestion of some part of the urinary organs; but albumen rarely, if ever, occurs in the urine, without some other substance being also present, by which we may determine the cause of the presence of the albumen.

Blood-globules, fibrin, or pus-globules, are the three substances, one or other of which usually are present with the albumen, and by which the cause of its presence may, with tolerable certainty, be conjectured. The quantity of albumen is of less importance than the quality of the substances which accompany it.

Having made sure of the presence of the albumen, by chemical means, the microscope is absolutely necessary for determining whether blood-globules, fibrin, or pus-globules are also to be found.

The urine, in a phial, should be left at rest for twelve hours. If many blood-globules are present, a remarkably distinct red line of globules will form at the bottom of the bottle. Thus, sometimes blood may be seen, which could not otherwise be recognised. If but very few blood-globules are present, the eye will not perceive them, unless a drop of the deposit is examined by the microscope. It very rarely happens that blood-globules are found by the microscope, when no albumen can be detected by heat or acid. This arises, sometimes, from the solution of the albumen being excessively dilute; so that evaporation in vacuo over sulphuric acid is requisite to get a concentrated solution, which then will give a precipitate with heat and acid. Still more rarely, the blood-globules may be washed out of some small coagulum, long after all the more soluble albumen has been removed,—just as in the washing the clot from blood, the albuminous fluid is first and quickly removed; and long after the albumen is entirely gone, some blood-globules will still be capable of separation by further washing.

The fibrin can be seen solely by the microscope. If it be moulded into the urinary ducts of the kidney, and if albumen is also present, with or without blood-globules, you may be quite certain that there must be congestion of the cortical structure of the kidneys, and most probably the disease is Bright's disease, or the result of scarlet fever. The history and accompanying symptoms enable you to perfect your diagnosis.

If blood-globules are found, and no fibrinous casts, it is most probable that the congestion is not in the secreting structure of the kidney; and if crystals of uric acid or oxalate of lime are seen, then probably some calculus is causing abrasion of the vessels of the mucous membrane. Whether the calculus is in the pelvis of the kidney, the ureter, the bladder, or prostate, must be determined by the general symptoms. The nature of the epithelium that occurs in the urine will also sometimes help to determine this question. The occurrence of the blood only on exertion, tends to confirm the diagnosis of a calculus.

If pus-globules are found with albumen, you may be certain that suppurative inflammation is going on; if, at the same time, fibrinous moulds are seen, then probably Bright's disease and inflammation of the pelvis co-exist. If there are no moulds, but blood-globules and pus-globules, then probably a calculus has caused, not only abrasion, but inflammation, of the mucous membrane. If fibrinous moulds, blood-globules, pus-globules, albumen, and crystalline deposit, are seen, then degeneration of the kidney, inflammation, and calculus, have been found on post-mortem examination.

But you will say, how can we distinguish pus from mucous globules? The appearance of well-formed pus and mucous globules is very different; in pus-globules active nuclei are most always to be found—that is, young pus-cells growing within the old ones. Mucous does not thus multiply; the cell is slightly granular only. With mucus, exudation globules do not occur; with pus, they are constantly found.

Ropiness with alkalies is not peculiar to pus, but mucus is very rarely present in sufficient quantity to admit of this action of alkalies.

Pus-globules also appear to have a higher specific gravity than mucous globules; on standing in a phial with urine the pus falls in a distinctly bounded sediment; the mucus forms a cloudiness, with much less defined border.

These are the best diagnostic marks I can give you; constant practice in looking at such sediments will be of great assistance; but even to the most practised eye slight alterations of the pus and mucus will hinder you, in some rare cases, from being perfectly certain which you are looking at, but by watching the urine made on different days for a short time you will not long be in doubt. If no trace of albumen is present, the globules must be mucus, and cannot be pus; for pus consist of cells in an albuminous fluid. The quantity of albuminous fluid may be very small indeed, and the number of cells may be very great, but if pus be present there must always be a trace of albumen detectible, on careful examination. The quantity of albumen will vary with the intensity of the inflammation, that is, with the degree of congestion that is present.

The determination of the presence or absence of albumen in the urine is of the greatest importance, because if it be not found, neither fibrin, pus, nor blood, can as a general rule, be present. Thus by determining the absence of albumen, we may infer the absence of blood-globules, fibrin, and pus, and we may conclude that neither Bright's disease, calculus, nor inflammatory action in the mucus membrane is present; but, when the presence of albumen is determined, no deduction can safely be drawn from this fact, until the further question is answered, as to the presence of the fibrin, blood, or pus. By these, the meaning of the albumen can be known with tolerable certainty, and the treatment must, in great measure, be determined by the conclusions we thus arrive at, regarding the presence of disorganization, mechanical abrasion, or inflammation.—*Lancet March* 16, 1850, *p.* 323.

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72. ON AN OPTICAL TEST FOR ALBUMEN IN FLUIDS.

Biot was the first to discover the property possessed by albumen, of rotating the plane of polarization of a ray of light transmitted through its solutions, and to ascertain that the degree of angular deviation was proportionate to the concentration of the solution. Bouchardat, after a few experiments upon the albumen of the egg, and one trial of human serum, calculated the molecular rotatory power of albumen at 27° 42.' He was prevented from extending his researches by the imperfection of the polariscope which he used, as it did not permit a polarized ray of the requisite colour, or of sufficient intensity, to be passed through a thick stratum of serum.

M. Becquerel has made observations upon serum, and other abluminous fluids, by means of a modification of the apparatus recommended by Biot and Mitscherlich.

A ray of light, polarized by means of a Nicol's prism, is transmitted through the axis of a tube, of nearly eight inches (twenty centimetres) in length, terminated at each end by a flat plate of glass, and capable of holding the fluid under examination. Between the tube and the observers's eye is interposed a prism of Iceland spar, cut, however, so as to transmit a *single* image. This prism is situated in the axis of a graduated circle, round which it can be rotated, and from which the degree of rotation may be read off with great exactness. These are the essential parts of the polariscope. In using it, the analysing prism must first be rotated till no trace of the polarized beam is transmitted to the eye. If now the tube be filled with an albuminous fluid, it will be found that light is transmitted, and that, in order to obscure the image, the analysing prism must be further rotated to the right or left. The angle described by the additional rotation of the prism is then read off upon the scale.

In examining serum, and other organic fluids, M. Becquerel has, *by direct chemical analysis, confirmed the indications of the optical test*, and has constructed a table, indicating, for each *minute* of deviation, the corresponding amount of albumen.

He concludes—1. That the albumen held in solution by serum and other organic fluids causes the plane of polarization of a transmitted ray to deviate to the *left*.

2. That the degree of deviation is proportionate to the amount of albumen contained in each liquid, and that, by means of the angle, the amount of albumen may be directly calculated.'

3. That the "molecular rotative power" for albumen is about 27° 36′; and that, in examining a fluid, each *minute* of rotation may be held equivalent to 18 parts of albumen per 1000.

4. The possible error of observation does not exceed four or five *minutes*, and hence cannot affect the calculated result by more than ·1 per 100 —a degree of accuracy which can be attained by no known mode of analysing albuminous fluids.

Becquerel, who has applied this new optical test to more than 150 specimens of serum from the blood, and to 50 pathological fluids, has never met with an instance in which it contradicted the results of direct chemical analysis. We need hardly say, that a test of such delicacy would be a most welcome addition to our present rather imperfect means of examining morbid fluids for albumen, were we assured that no other substance could interfere with its indications. In the progress of Bright's disease, it is of great importance to watch, from time to time, the amount of albumen contained in the urine. Hitherto we are not aware that any more accurate test has been applied, than that commonly employed by Dr. Christison—viz., to estimate the amount of albumen by the depth which it occupies in the tube in which it is heated. The test proposed by Becquerel would be quite as easily applied, and, if other substances met with in urine do not possess optical properties analogous to those of albumen, would afford far more satisfactory result. The apparatus requisite for the repetition of Becquerel's experiments is difficult of construction, and consequently; expensive. Those who may chance to possess it, and wish to investigate the subject, will do well to study the mode of manipulation described in the 'Gazette Mèdicale.'

The *polariscope* in four cases, indicated an average deviation of 5° 21—*i. e.* 57·78 per 1000.—*Monthly Journal, Jan.* 1850, *p.* 65.

73.—ON THE USE OF GALLIC ACID IN ALBUMINURIA.—By G. SAMPSON, Esq., late Surgeon to the Salisbury General Infirmary; and JOHN LYELL, Esq. Newburgh, Fife.

[Mr. Sampson has seen so great benefit arise from the use of gallic acid in cases of albuminous urine, that he calls the attention of the profession to the subject with the view of obtaining for this medicine a more extensive trial. Out of four cases related by Mr. Sampson, it will be sufficient to lay before our readers the first, which was that of an elderly gentleman who laboured under frequent and painful micturition, and other symptoms of prostatic disease, and whose urine was of low specific gravity, (1 011 to 1 013) and contained a large quantity of albumen. Mr. Sampson tells us:]

The first remedy which I suggested was a suppository of opium and hemlock. This was used for a fortnight or three weeks with some relief of pain, but with no other benefit, and it then occurred to me that as gallic acid has the property of speedily arresting the escape of blood corpuscles in hæmorrhage from various structures, it possibly might, if given in large and frequently-repeated doses, check the loss of albumen from the blood through the kidneys.

Accordingly, on the 14th of May, I recommended him to take ten grains of gallic acid in infusion of orange peel every six hours. This he continued to do till the 3rd of June, by which time the specific gravity of the urine had increased to 1·017 in the morning, and 1·019 in the evening; it had also become moderately acid, and decidedly less albuminous. The bladder was also so much less irritable that the patient could retain his water for a period of four and even five hours; the pain had greatly diminished, he felt stronger, and his appetite had improved. The acid, for some reason, was then omitted for eight or ten days, but the pain again increased, although the quantity of opium in the suppository had been augmented.—The patient was therefore requested to resume the acid, which he did, and persevered in taking it until the middle of August, during which time his symptoms progressively improved, and he declared that he felt himself well. At that time the urine was acid, of a deep straw colour, with only the faintest possible trace of albumen, and its specific gravity was 1·019 in the morning, and 1·020 in the evening. Circumstances preventedmy seeing this patient again till very recently, when I learnt he had suffered from a severe attack of diarrhea, which had reduced his strength and brought back many of his old symptoms. The urine, however, even under this disadvantage, is, at the time I write, less albuminous than when I saw him first, and I confidently expect he will quickly improve again under the use of the gallic acid.

[Mr. Sampson has also given gallic acid with success in a case of gonorrhœa of eight days' standing. The dose was twelve grains, five times in twenty-four hours.]—*Lancet, Dec.* 1, 1849, *p.* 577.

[Mr. J. Lyell, of Newburgh, Fife, states that he used gallic acid in cases of albuminuria for upwards of three years, and generally with the best effects. He gives the following case as illustrative of his practice.]

Mrs. A., a married elderly lady, consulted me on Sept. 16, 1846. She had for some time been in delicate health, but several of her relations having died dropsical, she only got alarmed about herself on the appearance of swelling in the feet and ankles. She had a dirty, sallow complexion; her eyelids were puffy; her feet and legs œdematous; and indeed, anasarca to a certain extent was apparent over the whole of the body. Examination of thoracic and abdominal viscera elicited nothing abnormal; the kidneys alone seemed to be at fault; there was dull pain in the lumbar region, particularly on pressure; the urine was scanty, diminished in specific gravity, albuminous to one-fifth. After using the warm bath, and counter-irritation over the loins, the patient was put under the use of gallic acid, taking about twenty-five grains daily in divided doses. Speedily, on testing with iron, the acid was found in the urine, and steadily the albumen began to diminish. In ten days, after using about six drachms of acid, every trace of albumen had disappeared. There was still, however, slight anasarca present, to remove which, and expedite the cure, infusion of digitalis was prescribed; this, and a subsequent gentle tonic (colomba), removed every ailment. The patient has remained well ever since, being now upwards of three years ago.

This, and several other cases of a similar description, I laid before Prof. Christison, in my correspondence with that eminent physician, who immediately subjected the acid to a trial, and brought the matter under the notice of his clinical class. This will be seen by referring to 'Gallic Acid' in the last edition of his 'Dispensatory,' second edition, 1848. I thought of publishing a few cases on the use of the acid at the time when first used, but under the advice of the professor, I refrained till experience of its benefits had been more matured. The independent evidence of Mr. Sampson certainly says something in its favour. Since the writings of Dr. Bright appeared, the pathological conditions of the kidney inducing albuminuria have been much elucidated by the researches of Gluge, Simon, Prout, &c.; yet, however much our knowledge has increased in this respect, our powers of distinctional diagnosis have by no means kept pace with it. Hence the acknowledged difficulty in any given case to predicate the true *origo mali*—whether the organ may simply be congested, inflamed, choked up in the tubes, or in a *sui generis* state palpable to the knife and microscope, but hard to associate with a well-defined set of symptoms during life,—or whether, in fact, the kidney be at fault at all, and the evil rather dependent on the quality of the blood, as a few pathologists, in some instances, believe to be the case. It is true, that the use of gallic acid in albuminuria savours somewhat of empiricism, yet, with all our boasted knowledged, how often are we forced to be empirical in our treatment of disease. I have now used it in very many cases of albuminous urine, often, though not uniformly, with decidedly good effects. When it speedily becomes manifest in the secretion, it usually does good; if it fail, after a day or two, to make its appearance there, no benefit can be expected, and it should be given up. In the albuminuria consecutive to scarlatina I have scarcely ever used it; counter-irritation, the warm bath, with an infusion of digitalis and broom, never fail once in twenty cases to relieve these sequelæ.

I believe, that in most cases of albuminuria, gallic acid may safely be made trial of as a remedial agent, not neglecting, of course, other obvious measures of relief; it will soon indicate those cases it is disposed to benefit. When our differential diagnosis of kidney disease gets more precise, we may be able to prescribe the acid to its appropriate cases at once; till then, we must cautiously feel our way.—*Lancet, Dec.* 8, 1849, *p.* 608.

[illegible].—ON THE ALKALINE AND EARTHY PHOSPHATES.—By Dr. R. H. Bence Jones, F. R. S.

[After briefly recapitulating the nature of the salts of phosphoric acid, and stating that the *tribasic* salts alone occur in the human body, Dr. Jones proceed to say :—]

It is probable that all the three (tribasic) phosphates of soda occur in the blood; if not at the same time, yet at different times and under different circumstances. The common phosphate and the alkaline phosphate certainly exist in the blood: in the urine the acid phosphate and more surely the common phosphate occur. There are earthy phosphates also present in the urine—namely, phosphate of lime and phosphate of magnesia, but the phosphate of soda are almost without exception always present, in much greater quantitiy than the earthy phosphates. The phosphates of soda are very soluble in water, and in acid or alkaline urine they are held in solution. They never fall as a precipitate, but, like the sulphates of potash, or soda, they may be in excess, and yet not make themselves apparent: we can make them appear, but they also do not show themselves under any circumstances. The lime and magnesia phosphates, on the contrary, are not very soluble in water, and they are nearly insoluble in alkalies, but they are very soluble in acids of any kind, even in acid phosphate of soda. Usually when the earthy phosphates are precipitated from the urine, there remains in solution three or four times as much phosphate of soda. The phosphates of soda in the urine are the most abundant. The earthy phosphates as regards quantity are of much less importance. Hence, as to quantity, if we speak of phosphates in the urine, we ought to limit that term to the alkaline phosphates, and not apply it to the earthy alone, as is at present done. The amount of earthy phosphates precipitated when the urine becomes alkaline, is solely dependent on the amount of the earths present—that is, on the quantity of lime and magnesia passing out of the system, By taking lime-water or magnesia, or by adding these to the urine; we may increase the earthy phosphates; and finally, if we add enough, we may precipitate all the phosphoric acid in combination with these earths, and leave no phosphate of soda in solution. On the contrary, if we could take away all the lime and magnesia, though we had a great excess of phosphate of soda in solution, yet we should have no precipitation on the addition of alkalies, but on adding any lime or magnesia to such alkaline urine, an immediate precipitation of phosphate of lime or phosphate of magnesia would occur.

The general conclusions I come to are these :—

1. That the amount of earthy phosphates depends chiefly on the amount of earthy matter taken into the body.

2. That the amount of alkaline phosphates depends chiefly on the food, but that exercise also causes some increase of these phosphates. These, being soluble in fixed alkalies and in carbonate of ammonia, never fall as a precipitate when the urine becomes alkaline, although the earthy phosphates then become apparent. These last indicate only the quantity of earthy matter in the urine.

In the first edition of Dr. Prout's work, he called the phosphatic diathesis the phosphatic or earthy diathesis. He corrected the earthy for the term alkaline diathesis; and then, in the second edition, he returned to the phosphatic, or earthy diathesis. From my experiments I consider that what Dr. Prout, and all others after him, call the phosphatic diathesis, is, in fact, nothing else than the precipitation of the earthy phosphates, in consequence of the alkalescence of the urine, and I consider that the term alkaline urine is the most fit to be applied thereto.

Urine which is alkaline from carbonate of ammonia, carbonate of soda, carbonate of potash, or phosphate of soda, is not able to dissolve the earthy phosphates, and they therefore fall as a precipitate. This precipitate of the earthy phosphate solely depends on the urine being or becoming alkaline. It will add not a little to the clearness of our view of urinary diseases, if this meaning of the term phosphatic diathesis is entirely given up, and its place supplied by the term alkaline urine; and it will give still more precision, if, when the earthy phosphates are precipitated by carbonate of ammonia, such urine be called ammoniacal urine, and if, when the earthy phosphates are precipitated by fixed alkali, this urine be called alkaline, from fixed alkali. The term phosphoric diathesis, I consider, ought to be used (as the term sulphuric diathesis is) to denote an increase in the total amount of phosphates, alkaline as well as earthy; and this term ought not to be applied to the mere precipitation (it might be of only a very small amount) of the earthy phosphate alone.

The total amount of alkaline and earthy phosphates in the urine never makes itself evident to the eye, for the phosphates of soda never fall as a precipitate. Like the sulphate of potash or soda we never can tell whether there is much or little present in any urine by merely looking at it. The earthy phosphates show exactly how much earthy matter—that is, lime and magnesia—is present, but they are no index whatever to the amount of alkaline phosphates in the urine. I consider, then, for these reasons, that what is now called phosphatic diathesis ought to be called alkaline urine, and the term phosphoric diathesis ought to be applied to an increase in the total amount of alkaline and earthy phosphates, and if limited to one phosphate, it ought to be given to the alkaline phosphate, because there is four or five times less of the earthy than of the alkaline phosphate in the urine; moreover the term earthy diathesis, if used at all, ought to be given to urine which contains an excess of lime and magnesia, and not to the precipitation (it may be, of only a small quantity) of these substances in consequence of the urine having lost the property of dissolving them by becoming alkaline.

Alkalescence of the urine and an increase in the total amount of phosphates have no relation of any sort or kind to one another They are totally distinct; in fact, they are rather opposite states. At least, ammoniacal urine generally contains only a small quantity of alkaline and earthy phosphates, and urine, which contains a great excess of alkaline and earthy phosphates, is generally highly acid, and remains so without undergoing decomposition above the average time.

As in the sulphuric diathesis, so in the true phosphoric, some method must be employed to cause the precipitation of all the phosphates. The addition of chloride of calcium, and ammonia, free from carbonate, is generally sufficiently accurate for the purposes of comparison. No judgment by the eye of the quantity of precipitate can with safety be relied upon; for quantities we must trust only to the balance. Where it is a question of quality, as of the presence or absence of albumen or sugar, the eye may be trusted; but for quantities, the eye alone will lead to great mistakes.

After a long inquiry into the total amount of phosphates in various diseases, the conclusions at which I have arrived are these. The details of the cases which led to these conclusions are given in 'The Lancet' for 1847.

1. The variations of the earthy phosphates are so dependent on the earthy matter (lime and magnesia) present in the urine, that no deduction from them as to the nature or state of the disease is possible.

2. Neither the earthy phosphates nor the alkaline phosphates are permanently increased in spinal diseases.

3. In fevers and acute inflammations of fibrous, muscular, or cartilaginous tissues, the total amount of earthy and alkaline phosphates is not increased.

4. In chronic diseases in which the nervous tissue is not affected, no deduction can be drawn.

5. Chronic cases of mania, melancholia, and general paralysis of the insane, gave no marked results.

6. In chronic diseases of the brain, and in chronic and even acute disease of the membranes, there is no increase in the total amount of earthy and alkaline phosphates.

7. In fractures of the skull, when any inflammation of the brain comes on, there is an increase of the total amount of phosphates. When there are no head symptoms, no increase of the phosphates is observed, even when other acute inflammations supervene.

8. In acute inflammation of the brain there is an excessive amount of phosphates in the urine. When the inflammation becomes chronic, no excess of phosphates appears in the urine.

9. In some functional diseases of the brain an excessive amount of phosphates is observable; this ceases with the delirium. Delirium tremens shows a remarkable deficiency in the amount of phosphates excreted, provided no food is taken. When food can be taken, the diminution is not apparent.

As regards the treatment of cases, in which an excess of alkaline and earthy phosphates exists in the urine, very little is to be said. The excess of phosphates is the result of the disease, and not its cause. Stop the disease, and you lessen the phosphates: it by no means follows that you would produce the smallest effect on the disease, if you could lessen the excretion of the phosphates. The excess of phosphates in the urine may lead you to a right diagnosis, but to consider that the increase of the phosphates in the urine constitutes the disease will only mislead you from the treatment of the real complaint.

As regards the treatment of those cases in which the earthy phosphates are precipitated alone from the urine, it resolves itself simply into the means of keeping the urine acid—that is, of hindering the urine from becoming alkaline, whether from fixed alkali or from carbonate of ammonia.—*Lancet, March* 2, 1850, *p.* 259.

75.—ON THE RELATION OF THE URINE TO THE FOOD AND TO THE SYSTEM: AND ON THE GENERAL METHOD OF EXAMINING THE URINE. By Dr. H. Bence Jones, F. R. S.

[Dr. Jones commences the discussion of this subject by showing that the urine contains the same four classes of substances as does the food, viz., water, nitrogenized substances, non-nitrogenized substances, and ashes. He then proceeds to say:]

The kidneys are not to form urine, but to separate from the blood substances that are useless or hurtful to the system. Any organ that is used must be repaired, and the substance that has been used must be removed. Take the muscles, for example; the muscles consist of water, salts, non-nitrogenous fat, and a highly compound arrangement of carbon, hydrogen, nitrogen, oxygen, sulphur, and phosphorus. Carbonic acid, ammonia, water, sulphates, and phosphates are the last products of muscular action, and of the action of oxygen on the muscle. The intervening products probably are innumerable, as kreatine, kreatinine, uric acid, urea, choleic acid. Some of the products are thrown out of the body by the lungs, others by the kidneys. If the removal of some of these products by the lungs is stopped, the circulation through the lungs ceases in two minutes; the heart and brain are stopped, and from the mechanical stoppage in the lungs, death ensues. If the removal of these products by the kidneys is stopped, in two days the patient is poisoned; the nerve and muscle are affected by the poison, and chemical death ensues.

If beef-steaks (the muscles of an ox) are given to one who has taken strong exercise, and is in perfect health, they are dissolved, pass into the blood, and their chief use is to repair the muscles and nerves, not to form uric acid and urea, and the constituents of the urine. The waste of the muscles and other organs passes off in the urine, whilst the food nourishes the wasting organs. Such I conceive to be the clearest ideas I can give you of the relation of the urine to the system and to the food, and theoretically I consider this as the true healthy relation, and perhaps in a state of full bodily labour, when enough food, and no more food than enough, is taken, this may be the only relation; but provision has been made for too little labour and for too much food. If too much food is constantly taken, and too little exercise, plethora and hemorrhage must take place, if some escape for the excess of food be not provided. You have seen that the phosphates, sulphates, and urates are generally increased in the urine after food has been taken. If more food is taken than is required for the wants of the system, the excess is thrown out by the same organs that remove the waste of the muscles and other structures. If even excess of water alone is taken, the excess is thrown out partly, at least, by endosmotic laws not yet clearly applied. How the quantity of substances to be thrown out is determined, I do not yet distinctly see. As far as I can understand, it only adds to the difficulty, to say that the unvitalized portion of the food or water is thrown out, whilst that portion which is vitalized remains in the blood. When and why uric acid is formed directly from the food seem to me questions more likely to be solved by keeping them distinct from questions of vitalization. Long ago, Dr. Prout most fully recognized the fact, that the food not only nourishes the body, but, when excess of it is taken, passes off in part in the urine. That this double relation of the urine exists, I have also proved to myself in opposition to the theories I had formed. The facts, then, are these—food makes blood; blood makes muscle; this when used returns in a different form into the blood again, and passes out by the breath and urine. This is the first most healthy systemic or larger circle. The second less healthy relation is caused by excess of food or diminished wants of the system. The circle is smaller. The excess passes into the blood from the stomach, and passes out by the breath and urine.

The relation of the urine to the respiration—that is, to the inhalation of oxygen and the expiration of carbonic acid, must be also considered, in order to attain to any clearness of conception as to the nature of the excretion. If the discovery of the circulation of the blood is still considered as exercising the first influence on physiology and pathology—if the establishment of this principle is thought to have added more to our knowledge than any other fact previously known—if this be considered as one grand vital action of the human body, then I am sure that the grand chemical principle, the action of oxygen in the body, will, before any great length of time, be regarded as of equal importance. I will not attempt to compare these actions—indeed, they admit of no comparison; they are related and dependent on each other; they probably cannot even exist separately. The muscle would not contract without the chemical action of oxygen; the oxygen would not reach the muscle without the contractile action of other muscles assisting it in circulating it in the blood. There is no spot to which the oxygen does not reach. In the capillaries, in the minute texture of the various organs, the oxygen exercises its power of combining with hydrogen and carbon, giving warmth, and forming compounds, which pass out of the body chiefly by the lungs, the skin, and the urine. In the capillaries, of the kidney, as in other capillaries, oxidation is rapid, and the products of oxidation appear in the urine and other excretions. The colour of the urine, the arrangement of the elements of the effete compounds, perhaps even the acidity, depend on the action of oxygen, though it is possible, as regards the acidity, that in the minute texture of the kidney, an action similar to that in the stomach, which causes the liberation of acid there, may take place.

An example of the action of oxygen in the system is seen in the effects of saline draughts on the urine. The ordinary action of such medicines is, to lessen the acidity of the urine. How is this effected? We have taken some vegetable salt of potash: it passes off in part by the kidney, in the form of carbonate of potash. What has taken place in its passage? Some say the salt is changad in the stomach; that it is there that oxidation occurs, and that carbonate of potash is formed. But if the salt is injected into the veins (as in some experiments by Dr. H. Hoffman) the same result ensues, and thence it is evident that the oxidation may occur in the blood, and not in the stomach. If tartrate or citrate of potash are burnt, cabonate of potash and water result, and the same happens when tartrate or citrate of potash are taken into the system.

Very lately, Prof. H. Rose, of Berlin, ('Philosophical Magazine,' July, 1849), has made some most interesting experiments on the inorganic constituents of organic bodies, chiefly as regards their degree of oxidation. He divides the degrees of oxidation into fully oxidized, partially oxidized, and unoxidized. He compares the food, the blood, the flesh, and the urine. The food, if it consists of wheat and other grain, consists of organic substances, the inorganic constituents of which exist partly in an oxidized, partly in an unoxidized state. Vegetable food then, is partially oxidized. The blood is a partially oxidized body. The flesh is a partially oxidized body, but the quantity of unoxidized matter in the blood is larger than in the flesh. The urine is a perfect and fully oxidized substance. The inorganic constituents of the urine are as highly oxidized as it is possible for them to be.

Independently of these examples or proofs of the action of oxygen in the system, I do not think we could see oxygen going in with each inspiration, and carbonic acid coming out with each expiration, without believing that oxygen is continually working great changes in the body. I believe it will be proved, that when there is much change going on in the muscles or nerves, the effect of such changes will be found in the increase of certain combinations of oxygen in the urine. Thus increased action of the nervous system will show itself by the increased amount of the compounds of oxygen and phosphorus; phosphoric acid, combined with alkalies, will be found in excess. And when there is increased muscular action, the compounds of sulphur and oxygen will abound; sulphuric acid will appear in the urine in greater quantity than usual. When there is but little action of oxygen on these tissues, there will be a smaller quantity than natural of these substances in the urine. Such, then, is the best general view I can give you of the relations of the urine to the organs of the body, to the food, and to the respiration.

The urine in disease is not only affected by all these causes of variation, but many diseases—perhaps all diseases—have a peculiar effect of addition or substraction on the urine. In many diseases, as in diabetes and albuminuria, this effect can be discovered, and we can thereby recognize the disease. Not only diseases of the kidney, but diseases of other organs, or of the whole system, delirium tremens, or inflammation of the brain, fevers, or inflammations, may, by careful examination of the urine, be recognized. In doubtful cases, the value of such information may be very great, and as knowledge extends, the examination of the urine will be more generally made, not only in medical but in surgical cases also. I have known the removal of a doubtful cancer of the lip cause death, which might have been delayed, if not avoided, by examination of the urine. After death it was remembered that the patient had been in the house previously for diabetes, and was thought to be cured, but I examined the water taken from the bladder after death, and found sugar in it.

I have known the simple removal of a pile cause death, where the patient had albuminous urine; and probably, before long, no operation will be undertaken until it is known whether the urine is healthy or not; and also in the prognosis after an accident, the state of the urine is worthy of attention. The number of deaths after operations, at St. George's Hospital, during the last five years—1844 to 1848—was seventy-two cases, independent of lithotomy; and of these, thirteen cases, or near eighteen per cent, had disease of the kidneys. Moreover, the deaths after slight accidents, during those five years, may, in many cases, be traced to disease of the kidneys.

In conclusion, I will rapidly run over the general mode of proceeding in an examination of the urine.

The urine cannot be well seen, unless in a transparent vessel. A six ounce phial, filled with the urine, and sediment if there be any, will be sufficient for every purpose. If possible, the urine as soon as it is passed should be put into the bottle.

The first test to be used is litmus paper. The question you ask is—What is the state as regards acidity—not as to the quality only—but as to the quantity? Is it too much, or too little acid? Litmus-paper cannot fully answer this question. It can tell whether the urine is ammoniacal, or alkaline from fixed alkali, or contains little or much acid, but it cannot tell whether the acidity is more than it should be. Simple inspection of the urine is able to solve this question, and that better than any other mode whatever. There cannot be an excess of free acid in the urine without the uric acid being set free, though this often requires many hours to crystallize out. If, then, you wish to know if the urine is too acid, you must leave the phial at rest for twenty-four, and sometimes ninety-six hours; and if there be too much acid, red crystals of uric acid will be very distinctly seen adhering to its sides, or deposited. The microscope may tell you quicker, but it will not tell you more surely, than the naked eye. Whatever the degree of reddening of the litmus, or the amount of urate-of-ammonia sediment, you cannot with truth speak positively of excess of acid being present, unless you see uric-acid crystals; and it is only when free acid is present in the urine that alkaline remedies are absolutely necessary.

If the urine is alkaline, heat applied to the litmus-paper will generally tell whether it be from fixed alkali or ammonia. If the former, mineral acids and tonics have the best possible effect; if the latter, inflammation of the mucous membrane is the most probable cause of the change of the urea into carbonate of ammonia.

The microscopic examination of the sediment serves to confirm all these deductions. In the last case, pus-globules and prisms of phosphate of ammonia and magnesia are seen; in the former case, granules of phosphate of lime, and frequently oxalate-of-lime octahedra.

Here then, a short examination of the urine tells whether there is local inflammatory disease of the mucous membrane of the urinary organs, or whether the general disorder of the system is to be remedied by giving alkalies or acids.

After examining the acidity of the urine, if clear, the specific gravity is next to be taken, either by a urinometer, or by a bottle and balance. If the urine is of low specific gravity, the probability of albumen existing in the urine should be tested. If the urine is of high specific gravity, the existence of sugar should be suspected, and the more so the paler the urine is.

Having determined the specific gravity, a drop of the urine, with the sediment, should then be examined by the microscope. Pus, mucus, blood, fibrinous casts, urate of ammonia, uric acid, oxalate of lime, phosphate of ammonia and magnesia, may or may not be seen to be present. The drop of urine should then be left to dry on the glass for twelve or more hours, and then again examined, and sugar or urea may be then seen; and by the ease or difficulty with which the glass can be cleaned, albumen may be proved to be absent or present. The bottle, also, containing the urine, should, after twelve hours' standing, be again examined. Uric acid, blood, and pus, may then sometimes be more clearly seen by the naked eye. If, from this examination, pus is suspected to be present, the action of liquor potassæ on the sediment should produce ropiness. If fibrinous casts are seen, or adhesive matter forms on the slip of glass, the urine should be filtered and examined for albumen. If sugar is suspected, the sulphate-of-copper test, and the test by boiling with liquor potassæ, should be also tried.

Let me again repeat another example of the knowledge which may be derived from examination of the urine.

Let me ask this question. Is there blood or is there no blood in the urine? If there is, does it proceed from the most frequent disease of the kidney—Bright's disease, or from calculus? The first question, simple inspection of the urine after it has stood in the phial for twelve hours will generally decide. Usually the blood-globules are insoluble in the saline urine, they subside in twelve hours; and though the eye cannot judge with certainty whilst the blood-globules are suspended, it can judge most accurately when they have fallen, and form a layer at the bottom of the glass. For this no microscope is necessary, though it will more quickly decide this question; and without the microscope, the second question as to the cause of the blood, cannot be solved except by the general symptoms. If fibrious moulds of the ducts are found by the microscope, with blood, there can be no doubt that the blood is caused by congestion of the cortical structure of the kidney; and if this constantly exists, Bright's disease is present, and the low specific gravity and excess of albumen in the urine will generally help to confirm this deduction; the history of the case always being well considered. If with the blood uric-acid or oxalate-of-lime crystals are found, and the specific gravity is high, and fibrinous moulds are wanting, then most probably a calculus is present in one kidney. Perfect rest will help to confirm or contradict this diagnosis. These instances I might multiply; but these are sufficient to show you the value of examination of the urine for diagnosis and treatment.—*Lancet*, *March* 30, 1850, *p*. 375.

SURGERY.

FRACTURES AND DISEASES OF BONES, JOINTS, ETC.

76.—ON DISJUNCTION OF THE LOWER EPIPHYSIS OF THE HUMERUS.—

By Dr. R. W. SMITH, Professor of Surgery in the University of Dublin.

[Dr. Smith is of opinion that this accident has hitherto been confounded with fracture immediately above the condyles, and attributes the mistake to ignorance of the exact line of union of the epiphysis with the shaft of the bone. He says,]

Upon a former occasion, I pointed out the error committed by Vidal (De Cassis,) in supposing that the tuberosities of the humerus belonged not to the epiphysis, but to the shaft of the bone; and showed that there was no difficulty in comprehending the occurrence of osseus union in cases of separation of the superior epiphysis of the humerus, inasmuch as it formed one body with the tuberosities, and was still connected to living tissues.*

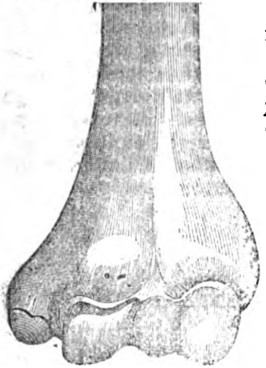
I shall now endeavor to demonstrate that a similar error has been committed with respect to the anatomy of the lower epiphysis of the humerus, and that those authors who have written upon the subject of injuries of the

* See Treatise on Fractures, &c., p. 202.

elbow joint have confounded with each other two very different accidents, viz., fracture of the humerus immediately *above* the condyles, and disjunction of the inferior epiphysis of the same bone; they have omitted to describe the diagnostic signs of the latter injury, and the means by which we are to distinguish it from luxation of both bones of the fore-arm backwards at the elbow, evidently from being unacquainted with the simple anatomical fact; *that the lower epiphysis of the humerus does not include the condyles, which belong entirely to the shaft of the bone.*

So complete is this ignorance on the part of Malgaigne (who has recently published on the subject of fractures,) that he has included separation of the lower epiphysis of the humerus among the *supra-condyloid fractures* of that bone.

Disjunction of the lower epiphysis of the humerus (of which I find no particular mention made either by Boyer or Sir A. Cooper) is an accident which has hitherto been confounded with fracture immediately *above* the condyles, an error from which it may be inferred, I think, that the exact line of junction of the epiphysis with the shaft of the bone is not generally known to surgeons.



At all events, it is manifest that by the authors from whose writings I have quoted, this line has been supposed to traverse the bone *above* the condyles; whereas the anatomical fact is, *that these processes belong exclusively to the shaft of the bone, and form no portion whatever of the epiphysis, which comprises nothing but the capitulum and the trochlea.* The line which marks its junction with the shaft is directed obliquely downwards and inwards, terminating below and external to the epicondyle, which, in the young subject, is distinct both from the epiphysis and from the shaft.

The lower articular surface of the humerus in the young skeleton differs from that of the adult bone in the following remarkable particular, namely, that the capitulum, or that portion which articulates with the head of the radius, is nearly double the size of the trochlea; so that the inferior surface of the former is nearly upon the same level as that of the latter process; and the humerus, when placed resting by its lower extremity upon a horizontal plane, assumes nearly a vertical position; in short, the radial is fully developed long before the ulnar portion of the epiphysis, and, as will hereafter appear, the knowledge of this fact is not destitute of practical importance in the diagnosis of that embarrassing accident, fracture through the line of junction of the epiphysis with the shaft, or, in other words, fracture of the humerus immediately *below* the condyles.

A description of the signs which characterize this lesion must also be, to a certain extent, an enumeration of those which accompany dislocation of both bones of the fore-arm backwards; many of the symptoms likewise belong to the transverse fracture, immediately *above* the condyles.

The injury usually results from a fall upon the elbow, but I have known it to occur from a fall upon the palm of the hand, the fore-arm being at the time extended upon the arm. The limb immediately becomes powerless, severe pain is experienced in the elbow, and the following signs present themselves:—The fore-arm is flexed, and the hand in a middle position between supination and pronation. The olecranon, drawn upwards and backwards by the triceps muscle, mounts above the level of the condyles of the humerus, these three processes forming the points of a triangle, the base of which is below. The antero-posterior diameter of the elbow is greatly increased, and the lower end of the humerus can be felt projecting in front. The application of a gentle force is usually sufficient to restore the normal appearances of the limb, but when the parts are abandoned to themselves the deformity soon recurs. If, after the removal of the displacement by extension, the fore-arm be rotated upon the humerus, or if the surgeon, as recommended by Dupuytren, grasps the arm in one hand, and the fore-arm in the other, and then moves them backwards and forwards upon each other, the crepitus which characterizes fracture can generally be elicited.—The motions of flexion and extension are exceedingly limited, and any attempt upon the part of the surgeon to communicate them produces severe pain.

The signs above enumerated are sufficient to demonstrate that the injury in question may readily be confounded with transverse fracture of the humerus above the condyles, or with luxation of the fore-arm backwards. The former would be a mistake of comparatively slight importance, inasmuch as the same treatment is applicable to both lesions: but the latter must be considered as a grievous error, the results of which are nearly as lamentable as those of leaving a true luxation of the joint unreduced.

As the loss of the normal relation between the olecranon and the condyles renders the separation of the epiphysis peculiarly liable to be confounded with dislocation of the fore-arm backwards, and as it is obviously a matter of the utmost importance to distinguish carefully between these accidents, let us now consider the signs, by availing ourselves of which we materially diminish the chance of mistaking it either for luxation, or for fracture above the condyles.

In case of fracture traversing the line of the epiphysis, the transverse diameter of the tumour which projects in front is equal to that of the opposite humerus, measured anteriorly from condyle to condyle; in this respect the accident resembles the dislocation of both bones backwards, but differs from fracture *above* the condyles. The outline of this osseous tumour is rounded, presents to the feel none of the irregularities or sharpness of an ordinary fracture, and upon its inferior surface, which is convex, and limited at either extremity by the condyles, neither trochlea nor capitulum can be distinguished.

When the joint is viewed posteriorly, two osseous prominences are seen, and can be distinctly felt; they are both placed above and behind the plane of the condyles, but are themselves situated (if the patient be be not more than six or eight years of age) nearly upon the same level, the internal, however, being always a little higher up than the external. At a more advanced age the distance between these two prominences is observed to be greater, in consequence of the increased development of the internal, which is formed by the olecranon, the summit of which process grows by an epiphysis.

At no period of life, however, at which it is possible for the accident in question to happen, is the distance between the two projections nearly as great as it is always found to be between those which, in cases of luxation of both bones of the fore-arm backwards, constitute so marked a feature of the injury. In the latter accident the distance averages about one inch and a half, while in the former it is seldom more than three quarters of an inch: the external tumour, in this case, being formed by the *capitulum of the humerus*, still surmounting the head of the radius, for which, in consequence of the concave form of its superior surface, it is extremely liable to be mistaken, if attention be not paid to the diagnostic sign which has just been mentioned.

I shall terminate this brief notice of fracture through the line of the lower epiphysis of the humerus, by stating as concisely as possible the points of resemblance and dissimilarity between it and the two injuries with which it is most liable to be confounded, viz., fracture immediately *above* the condyles, and luxation of both bones of the fore-arm backwards.

The symptoms which belong to it in common with fracture above the condyles are the following:—shortening; crepitus; the removal of the deformity by extension, and its tendency to recur when the extending force is relaxed; the presence of an osseous tumour in front of the joint; the increase in the antero-posterior diameter of the elbow.

It differs from the supra-condyloid fracture in the greater transverse breadth and regular convex outline of the anterior tumour; in the existence of two tumours posteriorly; in the loss of the normal relation of the olecranon to the condyles.

It resembles dislocation of both bones of the fore-arm backwards, in the following particulars:

The transverse diameter of the anterior tumour is the same in each case; so also is the antero-posterior breadth of the elbow; and in both the olecranon ascends above the condyles, the limb is shortened, and two osseous prominences can be distinguished posteriorly.

It differs, however, from luxation, in the existence of crepitus, the tendency of the deformity to recur, in the anterior tumour being destitute of trochlea and capitulum, and in the circumstance of the two posterior tumours being nearly upon the same level.—*Dublin Quart. Journal, Feb.* 1850, *p.* 63.

77.—OBSERVATIONS ON RICKETS.—By G. M. HUMPHRY, Esq., Surgeon to Addenbrooke's Hospital, Cambridge.

The true pathology of rickets consists, not in a deficient supply of nutritive material, but in a want of power to appropriate that material, so that the structure remains imperfect, and liable to disease. It is of no use, therefore, to cram the sufferers with various preparations containing the earthy salts, for there is no lack of these in the blood. The patients are generally pale, flaccid, sickly children, in whom the bones share want of nutritive energy and physical force in common with the muscles and other organs. The great indications, therefore, are to correct any disorder of the digestive system, and to endeavor to invigorate the body by light nutritious diet, fresh air, cold ablutions, &c., together with some medicinal tonic, such as quinine or iron. It is sometimes necessary to prevent the progress of the deformity in the lower extremities by steel supports, which may assist in bearing the weight of the body. The child with weak legs should be carried out in the air, and allowed to crawl about, but not to stand upright for any length of time.

We are obliged to be content with endeavors to prevent the further progress of the deformity, and allow the bones to solidify in their bent shape, for we cannot effect much benefit by attempts to straighten them. A few cases are related where the bones are said to have resumed their natural shape more or less completely. One is quoted from Ravaton, of a girl, aged 13. who, in consequence of rickets, was only three feet in height; she was confined to her bed with continued fever for three months, during that time the bones straightened and lengthened, so that at the end of it her stature had increased to five feet one inch.

I believe the lateral curvature of the spine resembles in all essential points the ordinary rickets of the extremities, depending, like it, upon the development of the osseous structure being insufficient to enable the bones to bear the increasing weight of the body. Like rickets, it is for the most part an affection of a passive kind, occurring during the period of growth, and is devoid of pain. Sometimes, however, it puts on active symptoms, progresses more quickly, and seems to depend upon an injury or some inflammatory disturbance.

In an affection of the spine, nearly allied to the one just described, particular bones are apt to suffer more than others, and these undergoing absorption or ulceration, are actually destroyed instead of being merely compressed. The vertebræ above and below falling into contact, become compressed together, so as to form an angle which projects backwards, and the superabundant arches corresponding to the destroyed bodies of the vertebræ are thrown into a wide curve over this angle, so that abundant room is still left for the passage of the spinal cord, and paralysis of the lower limbs very rarely ensues. This distortion generally takes place in children or young persons, and is situated near the middle of the dorsal region, or between the shoulders; hence the name "hump-back" is given to it. Slighter bendings in opposite directions take place above and below the chief one, which have the effect of maintaining the head erect, just as we found to be the case in lateral curvature, the change in the conformation of the chest is also much the same, the ribs being flattened at the sides and the sternum thrown forwards.

It seems not improbable that angular curvature of the spine corresponds with the changes just described as being produced in other bones by inflammation supervening when they are the subject of rickets, or in persons of scrofulous or sickly constitution. This specimen of angular curvature corroborates the opinion; the vertebræ above and below the chief seat of disease are porous, friable, and easily broken, a condition not unlike that of the monkey's bones just shewn you.

The changes leading to angular curvature are often unattended with pain or other inflammatory symptoms. The back is observed to "grow out," and in course of time it ceases to do so; no particular cause being assignable for the commencement or the cessation of the disease. It is probably often attended with the formation of an abscess at the seat of the mischief, though that abscess very seldom presents externally. It remains in a quiescent state, becoming enveloped in a thick wall of false membrane, or it is gradually absorbed. I have found such an abscess in the examination both of recent and long-standing cases, and have known it to come forward several years after the commencement of the deformity in the back.

It is further to be observed, that in both lateral and angular curvature of the spine, as in corresponding affections of the other bones, there is in after life a decided disposition to an excessive formation of bony matter. The vertebræ become harder, and they are anchylosed together, in these specimens, by bridges of bone passing from one to the other over the intervertebral substance, thus strengthening the column and at the same time preventing the possibility of a return to its natural shape.

After what has been said respecting the pathology and causes of lateral curvature, you will have no difficulty in apprehending the principles of its treatment. In addition to the measures most conducive to the general health, a moderate exercise of the part should be permitted. Do not enforce a rigid and tiring routine of exercises with dumb bells, &c., for this is likely to overstrain and weaken the back, and induce an increase in the disease; rather encourage the patient to take such recreation in the open air as she is able to enjoy. Allow her to lie down when she feels disposed, not upon any particular couch made to suit the fancy of others, but in such a position as is found to be most easy. Let the dress be fitted so as not to interfere with the movements of the arms or the body. Institute the alterations gradually, and take care not hastily to deprive the spine of an accustomed support. Sponging with cold water once or twice a day, friction, shampooing, &c., will all be found serviceable. By judicious management the progress of the deformity may be arrested in the greater number of cases, and, more than this, you will sometimes have the satisfaction of seeing the spine become straighter as the patient grows stronger.

It is scarcely necessary to condemn the practice of making the patient lie in certain positions upon a hard mattrass or board, the spine being stretched from time to time with pulleys: for it is now hardly ever adopted. The recent proposal of treating the deformity like a club foot and dividing the lumbar fascia and some of the muscles, is not likely to gain ground in an age of pathological inquiry like the present. Viewing the operation in its most favorable light, it will at once strike you that it is only one of the secondary and compensatory curves which would be in the least affected by it, and, therefore, evil rather than good would be accomplished by its success.

In severe cases, where the deformity is evidently increasing, it will be found desirable to furnish some artificial support to the spine, by steel props or crutches extending from the pelvis to the shoulders. If these be well made and fitted into the dress, they will afford great relief and will enable the patient to take exercise, of which she would be otherwise deprived. The means above mentioned for improving the general health and strengthening the back should, of course, be combined with these measures as far as possible.

A curvature of the spine does not necessarily indicate any very strong disposition to rickets in the rest of the bony system. It generally commences after the period at which rickets is displayed in other parts, and very frequently exists alone. You need not, therefore, be apprehensive of any deformity of the pelvis because the back is bent, unless there be some manifestation of rickets in the lower extremities.—*Prov. Med. and Surg. Journal, March* 20, 1850, *p.* 143.

78—OBSERVATIONS ON MOLLITIES OSSIUM.—By G. M. HUMPHRY, Esq., Surgeon to Addenbrooke's Hospital, Cambridge.

There is a disease of the bones, not uncommonly described under the title of rickets, and sometimes confounded with it, respecting which it may be well to say a few words. The disease referred to is called "mollities ossium." It is rather a vague term, and has been made to include a variety of affections.—cancer of the bones and rickets among others. In the sense in which we use it at the present day it signifies a disease of rare occurrence, so rare that you may never see a case in your lives. Nevertheless, it is a distinct disease, and the recorded cases that you will meet with in your reading, as well as the specimens in pathological collections, are sufficiently numerous to render it deserving of your attention.

It generally takes place in the following manner:—A woman (the affection is more common in women than in men) who has reached or passed the middle age, suffers an attack of rheumatism, paralysis, or a severe labour, which gives a shock to the system and prostrates her strength so that she does not quickly rally from it. After continuing in indifferent health for a time, she suffers pains in the limbs which are aggravated at night, and are thought by herself and her medical attendant to be rheumatic. However, the pain continues and is accompanied by increasing weakness loss of appetite, and an alkaline state of the urine. Perhaps she is pregnant again, and though the disease may not make much progress during the time, each labour prostrates her powers still lower and aggravates her sufferings. After unusual pain at some one part, the bones are observed to bend there, or they suddenly break during a slight exertion. Things go on in the same manner—one bone giving way after another, till the patient becomes utterly powerless, and in a few exaggerated cases she is described to have been reduced to a mere helpless mass of flesh. The course of the complaint is sometimes extended over several years; the amount of pain varies much, and the patient generally dies of exhaustion before she has reached the condition just mentioned.

Now, you will find many cases scattered up and down among surgical works, which correspond more or less closely with this account; some of them were evidently instances of cancerous disease, the real nature of the malady not having been understood by the writers, but in others the bones had undergone the change characteristic of mollities ossium, of which the chief feature is atrophy. Without being reduced in size they have undergone interstitial absorption, and are in consequence much altered in density; they are light, porous, and fragile; the haversian canals are dilated, and the cells of the cancellous texture are large; often the spongy substane is entirely removed from the interior of the shafts of the long bones, and the outer wall is so thin that it yields under the pressure of a finger nail. The cavities produced by absorption of the osseous substance are loaded with fat or oily matter, which has soaked its way into the remaining structure, so that the bones are very difficult to clean. Sometimes the interior of the bone is occupied by a soft, reddish, jelly-like substance, or by coagulated blood; now and then the red substance is absorbed, leaving cells filled with transparent fluid and lined by a membrane. These latter appearances seem to have been found when the progress of the disease was rapid ar attended with much pain. In most specimens of the disease the change that has taken place does not consist simply in partial absorption of the bony substance, accompanied by the effusion of a new material into its place; but, further, the osseous tissue which remains is throughout unhealthy, soft, and deficient in earthy matter, so as to admit of being cut easily with a scalpel. It is saturated with oil, and in some places will crumble between the fingers. In a specimen examined by Dr. Bostock, the earthy salts composed less than an eighth, instead of forming about one half of the whole substance.

The extent to which this change proceeds in the unabsorbed osseous structure, varies as much as the nature of the material effused into the vacant spaces. Here is a thigh bone from a man about 60 years old, which broke as he was turning in bed; and you see how soft and crumbling as well as porous it is. In this other specimen, where the whole skeleton is exceedingly light, and the absorption has proceeded to as great an extent as in the former, widening the cells and canals, hollowing out the bones, and reducing their walls to wafer-like tenuity, the remaining osseous substance is tough, and appears to be nearly sound. We do not know the history of the latter case; probably the change took place slowly; the bones resemble those found in persons who have been long bed-ridden, and subject to simple atrophy from disease.

This brief description is sufficient to show that mollities ossium differs from rickets in so many respects as to deserve a distinct name and a separate notice. In the first place, it occurs at a later period of life, commencing generally long after adolescence and sometimes taking place in advanced age. Secondly, it is an active disease, consisting not as riekets essentialy does, in a mere failure of the building processes, but depending on an alteration and rapid absorption of the materials which compose the skeleton—a pulling down of the structure after it has been completed. It presents the corresponding symptoms of pain and fever, and as you have just seen, effects other changes in the bones besides a mere wasting of their texture. It is quite true that rickets is not always a passive disease, consisting in a want of developmental force; it sometimes puts on a more active form, and then resembles the affection we are now discussing.—*Prov. Med. and Surg. Journal, March* 20, 1850, *p.* 146.

79.—ON THE SITE OF MORBID ACTION IN DISEASES OF BONE.—By Prof. GOODSIR, Edinburgh.

I have, in another place, directed the attention of the physiologist to the important distinction which exists between the essential and accessory elements of a texture. "A texture may be considered either by itself or in connection with the parts which usually accompany it. These subsidiary parts may be entirely removed, without interfering with the anatomical constitution of the texture. It is essentially non-vascular, neither vessels nor nerves entering into its intimate structure. It possesses in itself those powers by which it is nourished, produces its kind, and performes the actions for which it is destined; the subsidiary or superadded parts supplying it with materials, which it appropriates by its own inherent powers, or connecting it in sympathetic and harmonious action with the other parts of the organism to which it blongs."

The neglect of this distinction by the pathologist has been the cause of much misconception regarding morbid action in textures, and has introduced many errors into the general theory of disease.

Disease may have its site either in the essential or accesory elements of a texture.

Our knowledge of the diseases which have their site in the essential elements of the textures is still in its infancy; but I am inclined to believe that they consist principally of alterations in the the nutritive and reproductive functons, in the chemical or physical constitution of the textures. The fatty degeneration of the muscular texture is a familiar example of a morbid change of this kind.

The great majority of the recognized morbid changes have their site in the accessory elements of textures. They are situated in the midst of the areolar texture, and among the vascular and nervous networks which separate as well as connect all the essential textural elements of the frame. They consist generally of loody or other infiltrations; of lymph, in various stages of development; of pus; of the various forms of new formation, such as cancer, tubercle, &c. It will thus be perceived that the majority of diseases are situated, not in the essential textures of a part, but around or amongst them; that the majority of these ere new formations, parasitic in their nature, making their appearance, undergoing, development, and occupying a position in the areolæ of that general connecting texture, which, either in the form of the nucleated cellule, or of the filamentous fibre, is the first to appear, as well as the most lasting and abundant, of all the textures.

The more distinct the conception, therefore, which an observer may possess of the relative position of the essential and accessory elements of any given texture, the better prepared will he be to investigate and understand the phenomena of diseased action in that texture.

The successful investigation of the site and phenomena of diseases in one texture will render the investigation in all the others comparatively easy. I have been accustomed to consider the osseous texture as best adapted for this purpose, from its stability, and the comparative ease with which its essential and accessory parts may be separated from one another, distinguished, and examined. "A well-macerated bone is one of the most easily made, and at the same time one of the most curious, anatomical preparations: it is a perfect example of a texture completely isolated; the vessels, nerves, membranes, and fat, are all separated, and nothing is left but the non-vascular osseous substance."

The essential elements of the osseous texture consist of all that part which resists maceration, along with the contents of the corpuscles.

The accessory elements are the periosteum, with the vessels and nerves which ramify in it; the cells, areolar texture, fat, vessels, and nerves, which occupy the continuous network of haversian canals and cancelli, which are hollowed out in the hard substance.

I have been led to conclude,—

1. That in the osseous, as well as in the other texures, we must distinguish between those morbid conditions which have their site in the essential, from those which are situated in the accessory, part of the texture.

That, in reference to the changes in the essential parts of bone,

2. Caries, one of the most obstinate and painful affections of the texture, depends on the more or less complete obliteration of the corpuscles and canaliculi, and the conversion of the carious surface for a certain depth into a substance resembling the enamel of the teeth.

3. That all the inflammatory changes in bone have their site in, and

depend on, the increase or diminution in the number and size of the haversian canals.

4. That all the malignant and non-malignant growths in bone have their site in the haversian canals.

5. That the various forms of spicular and laminated exostosis, which are found coexisting with malignant or non-malignant growths, are necessary results of the dilatation and extension of the effected haversian canals.—*Monthly Journal*, *Feb*, 1850, *p*. 99.

80.—ON GONORRHŒAL RHEUMATISM.—By BRANSBY COOPER, Esq. F.R.S.

This is a not unfrequent result of gonorrhœa; but, it has been stated that it only occurs in cases in which balsam of copaiba had been administered. The copaiba seems to establish a tendency to inflammation of the synovial membranes; and those who advocate the use of cubebs in preferencence to copaiba employ this as an argument in favor of the former. I must acknowledge that, in all the cases of gonorrhœal rheumatism I have seen, copaiba had been given in an early stage of the original disease; and, if it continue to be employed, it greatly aggravates the rheumatic symptoms. Such cases are not, however, sufficiently common to enable one to acquire much experience upon the subject. Gonorrhœal rheumatism is very difficult to cure; generally, the subjects connot bear depletion, and colchicum does not seem to exercise any influence over the disorder. Calomel and opium ought to be given, and iodide of potassium and liquor potassæ are also of considerable service. Indeed, any of the remedies which give tone to the stomach will be found useful in these cases, as they are always, I believe, marked by disorder of the digestive organs and bowels.—*Med. Gazette*, *Dec*. 7, 1849, *p*. 958.

81.—ON NECROSIS, CAUSED BY EXPOSURE TO PHOSPHORUS VAPOURS.

[Mr. Stanley recently had a patient at St. Bartholomew's Hospital, who had lost the whole of his lower jaw by necrosis. The affection was ascribed to the influence of phosphorus vapour, to which the man was exposed in his trade of a *lucifer-match maker*. It appears, however, that means are now adopted to prevent such disastrous effects occurring in this occupation. We are told that]

Workmen in lucifer-match manufactories have now a chance of escaping the baneful effects of the evolution of phosphorus acid, by placing saucers filled with oil of turpentine about their work-rooms. As oil of turpentine is a solvent of phosphorus, it is expected that it will absorb the vapours which do so much mischief. This precaution is taken at a large lucifer-match manufactory in the neighbourhood of the London Hospital, and the very best results are expected from it. This case, so instructive in itself, was rendered peculiarly valuable in being brought forward by the distinguished author on 'Diseases of the Bones'; and we were sorry that the time and place did not allow Mr. Stanley to enter fully into the different questions which such a case naturally gives rise to; for instance, as to whether the fumes act primarily on the periosteum, or whether the jaw is secondarily affected. This question (left unsettled in the work just alluded to) appears of some importance; for if the constitution be affected first, the poison might be counteracted by throwing appropriate chemical agents into the blood. The two cases mentioned in 'The Lancet,' (Nov. 10, p. 498,) by Mr. Henry Taylor, of Nottingham, will prove very valuable to those who may investigate this subject in all its bearings. Two men, who were employed for a considerable time at the manufactory before they experienced any ill effects,—one in the upper, and other in the lower jaw,—suffered necrosis. These men were "dippers"; and it is but fair to suppose that the hand would have heen the first to suffer, had the effect been direct. It must however, be confessed, tha the *upper* maxilla being affected, in Case 1, militates against the following passage, which we find at p. 75 of Mr. Stanley's treatise: "Against the opinion that the phosphoric vapour acts merely as a local excitant, the objection has been urged, that produces no effect on the periosteum of the bones of the nasal passages, through which the vapour is directly inhaled." That these cases should not be classed among ordinary necrosis of bones, is sufficiently obvious, the entire absence of the least attempt at the regeneration of bone being the most characterestic differential feature. Nor could this regeneration well take place, as, to use Mr. Stanley's words, (p. 75,) "there is here a total want of the essential conditions for the re-production of bone—namely, inflammation in healthy structures, with health in the general system." The grey, pumice-stone-like, newly formed osseous substance, found by Dr. Heyfelder on the outer surface of the portions of bone which he extracted in similar cases, likwise points, as Mr. Stanley remarks, to an affection distinct from the usual death of bone. (Lancet, Nov. 16 1849.)—*London Journal, Dec.* 1849, *p.* 1156.

82.—ACCOUNT OF A NEW APPARATUS FOR TREATING FRACTURE] OF THE CLAVICLE.—By Dr. J. B. Coleman.

This instrument and its mode of action upon himself is thus spoken of and described by Dr. Coleman:

It was so arranged, that force applied to the ends of a lever at the sound shoulder, should produce the motions that were necessary to draw the fractured ends of the bone into true anatomical position, and hold them there, with but slight inconvenience to the patient. To do this, the apparatus was in the form of a shoulder brace, made of steel, and in outline nearly resembling the claviculæ joined together at the back. The space occupied by each clavicle was left open, or in other words, the steel work surrounded each bone, so that it could move considerably within the included space. The space over the scapula of the injured side was covered with buckskin, tight as a drum head, so as to make resistance on that part, and prevent motion; the other side was left open to allow free motion of that shoulder. The central part of the back brace had a long pad resting upon about eight inches of the spine. This prevented excoriation when force was appplied. The extremity of the brace on the side of the injury projected farther latterly than the axilla and above the deltoid projection of the shoulder. From this point a strap, furnished with a buckle for adjustment, passed down through the head of a wedged-shaped pad placed in the axilla. From the other side of the brace, two ends projected, one above, corresponding with the first named, the other lower down, on a line with the bottom curves of the brace. From these ends, straps proceeded to attach to a sling in which the arm of the injured side was suspended. The strap from the upper end buckled to the upper part of the sling, near the wrist, and that from the lower end, to the inner and lower part of the sling, somewhere about the middle of the forearm.

The operation of this arrangement is obvious. We have here a lever of the simplest kind. The power, the weight of the arm of the affected side, drawing by the hand, as occasion may require, on the straps connected with the ends of the shoulder brace last described—the fulcrum, the backbone; the resistance, the shoulder of the broken clavicle. The direction of the force upon the injured part is upward, outward, and backward; the means of retaining the bone in position simple, always at command, and not the least impediment to the mechanical movements of the ribs. The only point liable to excoriation is the axilla, and with this apparatus, less than other.

To prevent the brace from sinking on the back, and to guard against any lateral swerving, a piece of wood or metal about two inches wide is made so as to have sufficient elasticity, is attached to the central piece, extending down the spine, and adapted to its curvatures. This reaches somewhere near the waist, and is secured by a belt passing around the body.

Fifteen days after the fracture of a collar bone, I applied this apparatus to myself. Up to this time the slightest jar caused a movement between the ends of the bone, and unless the bandages were intolerably tight, perfect adaptation seemed impossible. From this instant, position was easily maintained, no movement seemed to disturb the bone, I was able to ride over rough roads without the least inconvenience, and when union took place, there was, what is extremely rare after these accidents, not the smallest distortion of outline. This experiment led me to use the apparatus in many other cases in which the results have been the same. ('New York Journal of Medicine.')—*Prov. Med. and Surg. Journal, Dec.* 26, 1849, *p.* 716.

83.—NEW METHOD OF TREATING FRACTURED RIBS.—By H. HANCOCK, Esq. Surgeon to Charing Cross Hospital.

[Mr. Hancock does not employ either the bandage or venesection, believing these means to be unnecessary, or even injurious. We are told that]

He relies chiefly on opium. By the use of this drug he subdues irritation, moderates inflammation, procures to the patient a very desirable amount of rest, and wards off all the thoracic complications which sometimes render these cases extremely serious.

It appears from a great number of cases of fractured ribs treated with complete success, without bleeding or bandage, that Mr. Hancock's method is at least as efficacious as that which has hitherto been adopted.—*Lancet, May* 4, 1850, *p.* 534.

84.—ON THE PRACTICE OF TENOTOMY IN SOME CASES OF FRACTURE.

[At a late meeting of the Royal Medical and Chirurgical Society, Mr. C. De MORGAN related the following cases of tenotomy in fracture, a practice not unfrequently followed by Continental surgeons. The first case occurred to Mr. Shaw, and is the following:—]

W. S., aged forty, was admitted into the Middlesex Hospital on Feb. 12th, 1847, having fallen down stairs in a state of intoxication. Both bones of the leg were broken, and the fracture of the tibia extended through both malleoli, the foot being twisted outwards. Violent spasms of the muscles frustrated all attempts to keep the fractured extremities of the bones in apposition; the slightest movement brought on this spasmodic contraction, which extended to all the muscles of the limb, so as to cause great distortion of the foot, and render the skin over the base of the tibia extremely tense. All the symptoms continuing unabated on the following day, and the suffering of the patient being considerable, Mr. Shaw determined on dividing, in the usual way, the tendo Achillis, which was very tense. After this, all the difficulties entirely ceased, and no further trouble was experienced in the treatment of the case. The second case occurred in the author's own practice. The patient was a female, aged sixty-six, of drunken habits, and was admitted into the Middlesex Hospital in March, 1849. She had been knocked down by a cab, and both bones of one leg were fractured a little above the ankle. The symptoms and condition of this patient were very similar to those of the last, and every mechanical and therapeutic measure which could be suggested to relieve the spasms were tried in vain. The author divided the tendo-Achillis on the ninth day, with instant relief to the suffering of the patient, and immediate removal of all untoward symptoms. In less than a month, the chasm left after division of the tendon, which was not very great, had disappeared; and, a fortnight subsequently, she was able to walk on crutches, and the foot was free from deformity. After some general remarks on the value of the operation in the foregoing cases in relieving suffering and spasm, the author proceeded to remark that he thought so simple and harmless a proceeding as dividing the tendo-Achillis might be adopted with advantage in other cases of more frequent occurrence, especially as the cure would not thereby be retarded. He concluded with noticing a remark of M. Bonnet's, that he has frequently divided the tendo-Achillis in cases of diseased ankle-joint, where rest was imperative, and the heel was drawn up by the muscles inserted into it.

Mr. B. **Phillips** said, that the paper was one of much interest, as it referred to the treatment of fractures and injuries of joints. The plan mentioned in the paper had been adopted in Germany and France to some extent; he trusted, however, that it would never meet with the same reception from British surgeons. Cases might occur in which the division of the rectus in fracture of the patella, or of the triceps for fracture of the olecranon, might be resorted to harmlessly, or usefully employed, where difficulties presented themselves in treatment, but, on the contrary, these operations might be resorted to where no necessity for the proceeding might exist. The propriety of the operation, however, under any circumstances, might be questioned. Let us look at the effect of the division of a tendon when of the proper length, as it would be in the cases in which it was proposed to divide it. Immediately, on section, the cut ends of the tendon separated to the extent of half an inch or more; this was usually the case, and in the instances recorded in the paper would appear to have occurred; a large space would thus have to be filled up by the deposit of new matter, and the tendon would be elongated. This occurred in cases where the tendo-Achillis was divided for retraction of the heel. When the tendon, before operation, was of the normal length, he feared the same result would follow as occasionally took place when the tendo-Achillis was ruptured by accident; the tendon would be so long that the heel could never be lifted from the ground. The late Justice Taunton ruptured the tendo-Achillis when dancing, and was lame ever afterwards; he could not raise his left heel. He feared this kind of result would render the operation at best but doubtful, though this elongation did not take place in the cases under discussion.

Mr. **Lonsdale** had had some experience in the division of tendons for the cure of deformities, and he had no such fear as that expressed by Mr. Phillips, that the tendon would become elongated on incision after division; on the contrary, his fear was, that it would be too short, and that union would be too rapid if proper extension were not kept up. In cases where the muscles were paralyzed and weak, the tendon after division might certainly become elongated, but not so when the limb was healthy. If the parts were kept properly together, no unnatural elongation would occur.

Mr. **Avery** had seen many preparations, in which tendons had been divided, and the union was so close that it was difficult to determine where the section had been made.

Mr. **De Morgan** observed, that in the cases related, the chasm between the divided portions at first did *not* exceed a quarter of an inch, that being sufficient to get the bone into position, and in a short time after there was no appreciable space at all. From what he had seen of the division of tendons when divided subcutaneously, he had no fear of their becoming lengthened. The cases in which tendons were lengthened from rupture by accident bore no analogy whatever to the cases he had related. He should not hesitate, after what he had observed, to perform the operation in cases of less severity than those detailed—even, indeed, to save two or three nights of pain or uneasiness to the patient. He should not hesitate to divide the tendo Achillis in cases of fracture of the lower ends of the tibia and fibula, where there was much spasm, even though that spasm might be relieved by splints or other apparatus.

Mr. **Charles Hawkins** considered that the operation under discussion might be usefully employed in some cases of injury, in which neither fracture nor dislocation was present, as well as to relive some of the urgent symptoms which occasionally presented themselves during the first few days in cases of fracture and dislocation. He had no fear that the tendon would become elongated. The plan, he thought, might be advisable in certain cases of fracture of the patella, which was an accident, as a general rule, reflecting less credit on the surgeon than almost any other. The limb was scarcely ever a useful one after that accident. This arose, no doubt, from the difficulty of keeping the ends of the divided bone in apposition. He had seen but one case in which bony union had followed fracture of the patella, but in this case the other patella had been afterwards broken, and lameness was the result. A case had presented itself to him the other day, in which it appeared to him that division of the tendo Achillis might have been of advantage. A lady, about eighteen months ago, became alarmed whilst driving along a country road, and jumped out of the carriage. She walked a considerable distance afterwards, but on reaching home complained of severe pain in the ankle joint, to which several applications were made, without affording her any relief. It remained stiff, painful, and useless, and the advice of the late Mr. Key was sought. Amongst other applications, caustic around the ankle was ordered, the cauterized surface to be kept open. He (Mr. Hawkins) saw this patient about a month ago. The ankle-joint was uninjured, but the tendo Achillis was so contracted that she could not put her heel to the ground, and was obliged to walk on her toes. There was great pain, which was relieved on the foot being straightened. No kind of apparatus had been of service. Might not division of the tendo Achillis in this case relieve the spasm? He thought, at all events, the trial should be made.

Mr. **Le Gros. Clarke** did not think that the profession generally would agree in the remark of Mr. Hawkins respecting the lameness said to follow fracture of the patella. He did not regard the division of the ligamentum patella as so unimportant as some seemed to think it, recollecting its contiguity to the knee-joint; and he questioned even its utility; for supposing that it did assist us in keeping the divided portions of bone together, the tendon would elongate in proportion, so that what we got in one direction we lost in another.

Mr. **Lloyd**, with respect to the question as to whether union was close after division of tendons or not, would answer, that in general the union was close. At first some space would exist, but it gradually got less until it would be almost inappreciable. He could understand that in some cases of fracture division of tendons would be serviceable, when, from the powerful action of the muscles, the ends of the divided bone could not be brought and kept together. He had never divided the tendo Achillis for this purpose, but he had suggested it. He was somewhat astonished at the remark of Mr. Hawkins respecting the results of fracture of the patella. The accident was a very common one; so far as he knew, all the patients he had seen recover with good limbs, and could, after a time, walk well. He recollected the case of an old gentlemen who fractured both patellæ: he was confined to one position for some time, but he eventually recovered and walked well. Younger persons usually walk as well after as before the accident. A gentleman, a good shot, and a great walker, fractured his patella from a fall; the accident was not discovered for some time, as his leg was broken by the same accident. When the fracture of the leg had united, the divided portions of the patella were found three inches apart. Contrary to expectation, at the end of a few months he walked as well as ever. When he (Mr. Lloyd) was first a student the divided portions of patella were attempted to be brought together by force; the result was, inflammation of the tissues of the joint, and occasionally lameness; but now such untoward results were not to be looked for. He had seen bony union of the patella in only one case, though he had seen the bone united after being broken into several pieces.

Mr. Charles Hawkins, in his observations, had referred to cases of fractured patella after they had left the hospital. When they left the care of the surgeon, they seemed well; but when the muscles were used and acted on the bone, the space between the divided bone became elongated, and the limb was used with difficulty. He mentioned the case of a country gentleman in whom this had occurred, no apparatus, except a very cumbrous one, being of service. He had seen a case of bony union of fracture of the patella consequent upon a blow from a wheel. Inflammation of the joint followed; no apparatus was applied; the leg was kept in the form of the letter V; and recovery, with bony union, took place, The other patella was subsequently fractured; bony union did not occur, elongation took place, and the motions of the limb were interfered with.

Mr. Bainbridge, (Tooting,) had, some years since, seen an instrument, which was invented by the late Mr. Earle, for treating fractures of the patella. He now used this instrument in cases of this accident: the patient walks about with it, after a few days; and never suffers from injury to the motion of the leg. Such injury, he believed, arose from binding the limb too tightly. He had seen cases in which the limb was bandaged from the toe to the hip. He related a case in which the ends of the divided bone were three inches apart, and yet the patient, a heavy man, walked well and freely. He related another case, in which the knee-cap was in the middle of the thigh, and the man walked about well. He had used Earle's apparatus.

Mr. Hodgson said, that generally, after tendons had been divided, they were shortened. He might mention, that in some cases in which the tendo Achillis had been divided for deformity, he had found the use of complicated apparatus to retard the cure, by producing sores and other inconveniences. In cases where section of this tendon had been resorted to, he thought it better to employ passive exercise of the parts; and, when able to bear it, to stand on the leg, and swing it backwards and forwards. In all cases of fracture of the patella which he had had an opportunity of examining after death, the union had been by cartilage or ligament. He had not seen a single instance where the fracture was longitudinal, of bony union. The ligamentous union was, he thought, to serve a good purpose; for were the union osseous, exudations from the bone might interfere with motions of the limb. He had seen two or three cases, in which the tendon above the patella had been ruptured, and a chasm was left afterwards, into which three fingers might be placed. This remained for life, to the great inconvenience of the patient.

Mr. Lonsdale considered that the shorter the ligamentous union between the divided portions of the fractured patella, the better it was for the patient, for the longer it was, the more difficulty he would have in walking. So long as the upper portion of the patella lay within the trochlea of the femur the limb would be tolerably useful; but when above it, not so.

Mr. Lloyd said that in cases of fractured patella, he was in the habit of placing a splint at the back of the leg, during the progress of cure and some time afterds; this he regarded as beneficial in keeping the divided portions of bone together.

Mr. Erichsen thought the Society greatly indebted to Mr. De Morgan for having pointed out so simple a means to enable the surgeon to obtain proper command over the foot in cases of fracture of the leg. Every surgeon must have experienced great difficulty in the treatment of oblique fractures of the tibula and fibula low down, from the inability to keep the foot in position, in consequence of spasm of the muscles of the calf, and if section of the tendo Achillis removed this, it was certainly a justifiable procedure. There was one class of injuries that had not been adverted to this evening, in which section of the tendo Achillis had been advantageously resorted to—he meant dislocations of the astragalus forwards; and its employment in these cases was one of the many improvements in surgical practice for which we are indebted to the modern school of Dublin surgeons. In the cases he alluded to, reduction was prevented in consequence of the impossibility of disentangling the upper surface of the calcaneum from the articulating surface of the tibia against which it was jammed by the spasm of the strong muscles of the calf. Now in these cases the tendo Achillis had been divided with the view of removing this spasm, so enabling the surgeon to obtain command over the foot and to reduce the astragalus. It had been done successfully in Dublin, but he was not aware that the operation had been practised in this country, except in one case in the provinces, that had been mentioned to him by his friend Mr. Cadge.—*Lancet, Dec.* 8, 1849, *p.* 618.

ORGANS OF CIRCULATION.

65.—ON THE TREATMENT OF ANEURISM BY ELECTRO-PUNCTURE.—By M. ABEILLE.

At the last meeting of the Academy of Medicine, M. Abeille, assistant physician to the Val-de-Grace, read a memoir on the above subject, of which the following is a summary:—

A female, 67 years of age, was affected with a tumor of the size of a hen's egg, which projected between the scaleni muscles, and presented all the characters of aneurism. It was, in fact, a pulsating tumour, the pulsations being isochronous with those of the heart; pressure on the artery above the tumor reduced it partially in size; pressure over the tumor gave rise to a sensation of *fremissement* under the hand, and the ear detected a very sensible *bruit de souffle*. From these symptoms, and particularly from the fact, that pressure above the tumor arrested the pulsations of the axillary and radial arteries, it was concluded, that the subclavian presented the anomaly of a common origin with the carotid, and ascended over the clavicle to penetrate between the scaleni muscles. All the medical men who examined the tumor were of the opinion that it was arterial, and the operation of electro-puncture were accordingly performed on the 10th February, 1847. The pile employed was composed of twenty pairs zinc and copper plates; the needles were steel, four in number, two to two and a half inches long, and covered with an isolating mastic to within one line of the point and two of the head.

The patient having been etherised, the needles were passed into the aneurismal sac, and the battery set to work. Strong sparks were elicited, and the operation continued for thirty-seven minutes. On awakening, the patient complained of atrocious pain, attended by convulsive movements in the muscles of the arm and wrist.

Within five minutes after the commencement of the operation the tumor began to solidify, the pulsations were less distinct and the pulse nearly disappeared. On extracting the needles, pressure equivalent to a weight of two pounds, was applied to the surface of the tumor. It was then quite firm, and without pulsation or bellows-sound. Twenty-four hours afterwards the pulse was totally absent in the radial artery; the arm was numbed and cold. As symptoms of cerebral congestion manifested themselves, it became necessary to practise two bleedings.

After the fourth day the tumour began to diminish in size; on the tenth day it was much smaller, and on the eighteenth diminished by one-half. It now remained stationary for a few days, then began to diminish again, and gradually disappeared. Thus, on the thirty-seventh day, the skin appeared perfectly flat; on making pressure, an oval, flattened, and firm body was felt in the place occupied by the sac; and, even three months afterwards some traces of the induration could be perceived. At this period the artery had acquired a slight degree of development just above the tumour; and three branches, not before evident, and supposed to be the vertebral, inferior thyroid, and posterior scapular, arteries, were seen to radiate from this point.

It is now two years and a half since the operation was performed, and the cure appears to be complete. The artery has not acquired any increased degree of calibre, and it requires excessive pressure with the finger to discover any trace of the old sac.

This, it must be confessed, is a brilliant success; and the fact, now indisputably proved, that electricity coagulates the blood in the living artery, may lead to further applications; but we must not conclude, from a few successful cases, that the new agent is to throw into the shade the discovery of Hunter. Even from the confession of M. Abeille, the pain occasioned by electro-puncture, in cases of this kind, is of so violent and distressing a nature, that the usual operation of ligature is preferable in all cases where it can be applied, as in aneurism of the femoral artery, &c. Besides, the accidents which may attend electro-puncture are fully equal to, if not greater than, those of ligature,—hemorrhage, cauterisation of the sac or skin, inflammation and suppuration of the sac, &c.

I should not omit to mention, in reference to the above, that M. Abeille has performed ten experiments on dogs and sheep, for the purpose of ascertaining whether the blood can be coagulated in a healthy vessel by means of electricity. In all the experiments the artery submitted to the action of electricity became plugged by a firm coagulum in a few minutes. ('Med. Times,' August 18, 1849.)—*Monthly Journal, Jan.* 1850, *p.* 71.

86.—ON A NEW MATERIAL FOR ARRESTING ALVEOLAR HEMORRHAGE, &c. By A. Beardsley, Esq., Derbyshire.

[The difficulty that sometimes occurs in arresting hemorrhage after the extraction of teeth, especially in a person of hemorrhagic diathesis, is well known. Mr. Beardsley describes a composition which he found useful as a plug in such cases, and also for other purposes.]

J. T., aged twenty-three, applied to me, on the 27th November, 1847, to know if I could extract for him the first molar tooth, upper jaw, right side. He stated that the adjoining tooth (second molar) had been extracted two years previously, and that he nearly lost his life from the excessive hemorrhage which followed, and which defied the use of every remedy for several days. He was naturally anxious about the result; and as there was every probability that it might occur again, I devised the following means of arresting it, so as to be prepared:—I made a composition of gutta percha, tar, creosote, and lac, which can be rendered quite soft by moulding with the fingers, which is not at all sticky, and which again hardens in any shape into which it has been moulded.

On the next day I extracted the tooth. Immediately afterwards a jet of bright arterial blood followed, and flowed abundantly, the patient's mouth being full directly. I determined to try the usual remedies prior to using the above plug, and accordingly first tried the dossils of lint; but the hemorrhage was so rapid that it was perfectly useless. I introduced lint dipped in alum, the sesquichloride of iron, and then lint again, which appeared to diminish the flow a little, and after five minutes so far abated that the man went home. A short time afterwards, on opening his mouth, the blood flowed a freely as ever. He tried it till next day, and then came again, thoroughly blanched, the hemorrhage still profuse. I at once washed out all coagulum, and as speedily as possible inserted the above plug, softened as directed, and firmly pressed it into the socket. The hemorrhage was arrested immediately; the plug remained in situ without any trouble. Next morning the man brought back the plug, which had hardened in the socket, and was an exact fac-simile of the fangs of the tooth extracted. The case excited no further anxiety, and no hemorrhage afterwards occurred.

I also find the above composition a very ready and easy application for leech-bites, when the hemorrhage is at all troublesome. It is very adhesive when warmed, and firmly adheres all over the wounds when the part is wiped dry, and a small portion pressed on, just wetting the finger before doing so, to prevent it adhering to it also.

The proportions of the ingredients used are, gutta percha, one ounce; Stockholm tar, ounce and a half to two ounces; creosote, one drachm; shell lac, one ounce, or more, to harden it. To be boiled together in a small crucible, and constantly stirred or beaten, till it becomes thoroughly blended into a stiff homogeneous mass.

I have also used this composition moulded into bougies, which answer exceedingly well for stopping teeth, in toothache; and even for pessaries. The proportion of creosote can either be diminished or omitted for these purposes, though a little renders it more readily made, as it is a solvent of gutta percha.—*Lancet, Feb.* 9, 1849, *p.* 177.

87.—ON THE USE OF COLLODION IN NÆVUS.

D. **Brainard**, of Chicago, struck with the contractile power possessed by the etherial solution of gun-cotton, was induced to test its application to the surface of erectile tumours. The first case which he treated in this way was an erectile tumour, the size of a strawberry, situated over the anterior fontanelle of a very young infant. Although the tumour was considerably elevated above the general surface of the scalp, it was at once reduced when the solution had dried, and, after a second application, at the end of six weeks, seemed to be cured.

The second was a child, six months old, with an erectile tumour, of 3-4ths of an inch by half an inch, situated below the lower eyelid. This tumour had not existed at birth, but had made its appearance shortly afterwards, and attained its maximum size in about six months. Dr. Brainard applied the solution once a week, and, after two months' treatment, the tumour was hardly perceptible. ('N. W. Med. and Surg. Journal.')—*Monthly Journal, Jan.* 1850, *p.* 72.

[May not this hint be extended to the treatment of hæmorrhoids, and hæmorrhoidal excrescences?]

ORGANS OF RESPIRATION.

88.—OPERATION FOR RESTORATION OF THE NOSE.—By W. Fergusson, Esq., Surgeon to King's College Hospital.

[In this case the loss of the nose was due to a blow, received a long time previously; the patient was now forty years of age. We are told that]

Mr. Fergusson gave, in this instance, the preference to the Indian method; and the patient having been placed under the influence of chloroform, a triangular piece of leather, cut into the shape of the new organ, and made to suit the irregularities of the stump, was spread flat upon the forehead, with its base uppermost; deep incisions, with subsequent parings, were then made along the margins of the deformed nose, following the line, where the sides of the flap, to be presently cut from the forehead, were to be implanted. When the paring had been carefully and regularly done on both sides, Mr. Fergusson cut out the skin and cellular tissue of the forehead, down to the periosteum, according to the shape above mentioned and this being carefully dissected from above, downwards, to the root of the nose, where the dissection was carried deep, to render the vascular connection more extensive; the flap was twisted on itself, and its edges were brought into contact with the grooves previously made. An opening was here seen into the frontal sinus from an old exfoliation. The hæmorrhage was rather considerable, and somewhat increased the already great amount of trouble which this operation entails upon the surgeon; the sutures were, however, very neatly applied, three one side; they kept the transplanted structure very steadily in situ, and the angles of the raw surface on the forehead were likewise approximated by sutures. The cavity of the new nose, which was partly supported by the shrivelled remains of the old, was borne up by a small quantity of lint; the same was likewise put on the raw surface of the forehead; the parts were carefully and warmly wrapped up, and the patient removed.

Mr. Fergusson, in addressing the assembled pupils remarked that out of the various materials with which noses might be replaced, the patient had chosen his own skin, and that he had thought it right to comply with his request; the more so as he was a favorable subject for the operation, since the destruction of the organ had originally been caused, not by an idiopathic disease, but by a blow. The operation, as far as it has now gone, was only done in the rough, there was a great deal to shape out yet until the new organ should be brought to a proper form. Mr. Fergusson observed, that this would be an extremely painful proceeding, were it not for the great boon conferred by chloroform; and that Mr. Liston had performed the same operation soon after the anæsthetic use of ether had been introduced.

The patient,seven days after the operation, was attacked by erysipelas; he was delirius at intervals, particularly at night; the eyes and cheeks swelled considerably, and the new nose turned of a dull reddish colour.—Still the wound of the forehead went on contracting and granulating nicely. The delirium became soon so violent, that the patient was at one time hardly prevented from tearing off the new nose; it was therefore found necessary to use the straight jacket, and to give him a male watcher. He, however, became gradually quieter, and about eighteen days after the operation he was more calm, dozing almost incessantly; his face assumed a more natural and sane expression, but when spoken to he gave no answer, and appeared to be deaf. The treatment of the erysipelas and violent symptoms consisted principally in stimulants, as chloric ether and ammonia, opium, wine, &c. The nose, however, and the forehead, were looking very well; the latter was fast cicatrizing, and the former seemed to have adhered firmly, especially at the root. The opening into the frontal sinus above mentioned remains patent, and seems not disposed to fill up. Twenty-two days after the operation the patient was removed into the physicians' ward, where, after having given a great deal of trouble with delirium tremens, he is now progressing very favourably.

We had a few days ago an opportunity of seeing this patient, and were highly gratified at observing the firm manner in which the transplanted flap had grown to its new situation. The nose, though in an unfinished state, looks remarkably well, the man having of course quite a different phsiognomy. If it were not for the falling-in of the incisive portion of the upper jaw, the patient would certainly not have to complain of his looks.

It would thus appear that the rhinoplastic operation has in this case endangered the patient's life; and though erysipelas had a great share in these hazardous results, it cannot be denied that this apparently slight operation is not exempt from danger; neither are the statistics encouraging. Out of two patients, Blandin almost lost one; Lisfranc had one death; and Dieffenbach has recorded two fatal cases out of six. The Italian method, where the flap was taken from the arm, would *prima facie* seem less liable to the complications mentioned above; but it is so inconvenient that it has been very justly abandoned The French method, introduced by Larrey, in which the cheeks furnish the materials, has advantage in some cases, but is likewise liable to accidents.—*Lancet, April* 6, 1850, *p*. 419.

89.—MODE OF EXTRACTING FOREIGN BODIES FROM THE NOSTRILS.

Dr. **Homans** for many years has practised the following: Closing the nostril which is free, he blows forcibly with his own mouth into the mouth of the patient, and the result is the discharge of the body. He states that in no case where such substance completely obstructed the passage, as beans, peas, grains of corn, &c., had this method failed of success; but when the substance introduced was so shaped as not entirely to obstruct the passage, as a button, the air blown in might pass through and not remove the body. ('American Journal of Med. Sciences.')—*Brit. and For. Review, April* 1850, *p*. 544.

90.—CASE IN WHICH PARACENTESIS THORACIS WAS PERFORMED.—By Dr. G. F. Easton, Liverpool.

[A young man, 26 years of age, was the subject of an insidious pleuritic affection, arising from exposure to cold during convalescence from fever. Effusion took place, which did not yield to the use of mercury, blistering, and other remedies; and after a time there was evidence of the super-addition of pneumo-thorax. As, however, the quantity of air present appeared to be small, and as there were no symptoms of tubercular disease, it was supposed that the pneumo-thorax was not caused by the bursting of a vomica into the pleura, but was the effect of secretion, It being determined to perform paracentesis, Dr. Easton tells us:]

On Saturday, November 3rd, in the presence of Dr. Turnbull and Mr. Higginson, who kindly assisted me, a trocar was introduced into the right side of the chest above the eighth rib, and rather more than half a pint of pus removed. In attempting to adapt an apparatus to prevent the admission of air, the catula was partially withdrawn; and, as it could not be readily re-introduced, we were satisfied for the present with the information which was thus derived and the relief which was thus afforded. No bad symptom followed. A blister was applied to the affected side, and some cod-liver oil, with a bitter infusion containing iodide of potassium, was ordered to be taken daily preceded on the first occasion by a purgative.

At the end of a week, the dimensions of the chest having undergone no change since the operation, and the other physical signs of the disease remaining as before, the operation was repeated, and eight pints of the same inodorous purulent fluid were slowly withdrawn. This was accomplished without producing any material effect on the patient, except a disagreeable feeling which arose about the middle of the operation, and increased towards its termination, resulting from the removal of preasure to which the displaced vicera had become accustomed, and from the necessity occasioned by the collapsed condition of the right lung for their rather sudden movement in an opposite direction, to supply the vacant space caused by the abstraction of so much fluid. This lasted during the four succeeding days, and was accompanied by inability to lie on the affected side, on which he had formerly reposed with greater comfort, and by his experience as if any considerable pressure would have been attended with greater danger to the integrity of the ribs.

The entrance of air into the chest was effectually prevented by the use of an apparatus suggested by Mr. Higginson,* which, on account of its simple construction, its easy management, and its complete efficacy in this instance, I can recommend for employment on simular occasions, in preference to others of a more costly and complicated nature. It is simply a tube about a yard long, made of vulcanized india-rubber, which, being filled with water, and one of its extremities placed over the mouth of the canula, acts on the principle of a syphon. If it is properly adjusted, and the other extremity immersed in the fluid, air cannot by any possibility gain admission into the chest. The stream was free, uniform, and continuous, unaffected by the respiratory movements. To the middle of the tube was adapted an india-rubber bottle, which in this operation does not appear to be essential to success, when the fluid is moderately thin. When emptied by pressure, and then allowed to expand, it may be advantageously emyloyed to clear the tube, if the passage happens to be obstructed by lymph or coagulum, or other small bodies of a soft and yellow nature, or to wash out the chest with water, or any of the lotions which have been recommended for the purpose. And these seem to be the chief, if not the only advantageous uses to which it can be applied.

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* Mr. Higginson's apparatus is described in the 'Lancet,' Feb. 27, 1847, p. 240, as a simple form of stomach pump, without valves or stopcocks.

It is generally stated by writers, that when the operation of paracentesis is performed at a stage of the disease when the lung is incapable of expanding, that the operator has a choice of but two alternatives. He must either be content with the amount of fluid he is able to withdraw from the chest before the stream becomes interrupted (which is often only a small proportion of what is left behind,) or he must obtain a further supply at the expense of replacing it by atmospheric air, with the generally experienced consequences of renewed inflammation, increased and more offensive secretion, irritative fever, and too often rapid and irremediable prostration. Neither alternative is desirable; the former on account of the necessity imposed for a frequent repetition of the operation, the latter on account of the reasons already assigned. By the use of this simple apparatus both are avoided: the fluid may be almost entirely, if not wholly withdrawn; the sound lung is placed in the most favorable position for increased dilatation, and the condensed one gradually to regain its dimensions and recover its functions.

When the tube is filled, and its extremities placed in the positions I have indicated, its cavity is continuous with that of the chest, of which it may be made to form the most dependent part. The void uninterruptedly formed for the escape of the fluid at the lowest part of the tube is commnuicated upwards to the chest, where it will gradually increase, till the last remaining portion of the fluid has found its way by gravitation into the tube.

The patient sat during the greater portion of the time that was occupied in the withdrawal of the fluid, and towards the close was lowered into the recumbent posture to favor its escape by placing the opening in a more dependent position.

The trocar used on this occasion was of the size generally employed in the operation for hydrocele. A gentle flow in this case was especially called for to prevent laceration of important structures within the chest, in consequence of there being no substitution (as in ordinary cases) of atmospheric pressure for that of the fluid withdrawn. For this reason, too, the patient was directed to breathe with ease, and warned to make no sudden or vigorous effort, which might at all subject him to the danger we have specified—a danger great in proportion to the amount of effusion.

[Up to the middle of the fifth week ofter the last operation, the patient improved much in health and strength; but at this time a relapse occurred, and it became evident that matter was again forming. As the symptoms were not checked by the ordinary means, the operation was again resorted to. We are told by Dr. Easton, that]

On the 22d of December, six and a half pints of purulent fluid were withdrawn in the same way as formerly mentioned. It differed from that previously removed in being of a reddish-brown color, and quite inodorous. When this quantity had been removed, the patient complained that the canula was causing pain. Attempts were made to place it in an easier position; but, instead of relieving the pain, they had the effect of so much increasing it, that, neglecting the means of obtaining a further supply of mat-r we had formerly employed with advantage (viz., that of laying the patient down to make the opening more dependent,) the canula was withdrawn. By this omission a little fluid was left behind; and, by a little want of care either in adjusting or withdrawing the tube, a small quantity of air must have entered the chest, so as to render again audible the sound of splashing which had not been heard since the performance of the first operation. That the quantity was small was evident, as well from percussion as from the patient's experience of the same feeling I formerly mentioned, after this as the previous operation, though not to the same extent, or of so long continuance.

The two sides of the chest afterwards measured alike.

A favorable change in every respect immediately followed the operation. His sleep and appetite returned the same day, and the vomiting at once ceased. In two days the tongue was perfectly clean, and the cough greatly relieved.

The improvement, however, was of short duration. At the end of a fortnight the vomiting and other unfavorable symptoms returned. The vomiting was so severe as to return nearly every hour, as much as a quart of acid water being sometimes ejected at a time, and was particularly troublesome at night.

On this occasion I could assign no outward cause for the relapse, as the patient had avoided all stimulants, had never left his room, and had been almost entirely confined to his bed. This circumstance, coupled with an observation that the constitutional disturbance was quickly followed by an enlargement of the affected side, led me to this conclusion,—that the operation in a case so far advanced as the present one, whatever other benefit it may confer, has no effect in checking the further progress of the disease, and that the formation of pus proceeds without materially affecting the constitution, until it does so after a considerable accumulation, by causing injurious pressure on the nerves and neighboring organs.

If this be the case, then the disease is quite of a local character, not likely to yield to constitutional remedies, and may coexist and advance for a certain time (as, I think, on both these occasions it has done) with constitutional improvement. The shorter duration of the improvement on the latter than on the former occasion is probably attributable to the more rapid accumulation of the matter, partly in consequence of its less complete removal, and partly owing to the admission of air, which, by altering the character of the secretion, may have proved an additional source of irritation.

If this view of the case be the correct one, then it is obvious that a cure could not be obtained by the plan hitherto pursued, and could only be hoped for by keeping the secreting sac always nearly empty, with a view to its gradual contraction and ultimate obliteration.

Accordingly, the plan I formed was to remove the whole of the matter, wash out the right side of the chest with warm water, substitute a little clean water for a portion of the matter (as likely to prove less irritating,) to keep off the feeling of constriction, and then leaving the plugged canula in the chest, to draw off a certain portion of it and the secreted fluid at short intervals; supporting the patient, in the meantime, by a nutritive diet.

This was put into execution on Tuesday, the 22d of January. That the process of washing might proceed with facility and expedition, it was thought advisable to use something larger than the small canula hitherto employed, and of a material less liable to be acted upon by the secreted fluid. For this purpose a gutta-percha tube was formed, and for its admission an incision was made into the chest with a bistoury. It was easily introduced, and we were fortunate in having made it of sufficient size. At first the matter did not flow, and we were beginning to think there must be some mistake, when out it poured of a sudden, nearly as thick as treacle, of a sickly offensive odor, and of a somewhat darker color than formerly.

With the assistance of the syphon about three pints streamed forth. The stream becoming interrupted, some warm water was thrown in to dilute it. It again flowed freely, and we calculated that about two pints more of matter were thus removed, independent of the water with which it was mixed. Two or three injections of warm water were used, and it was our intention to have continued them until the water returned nearly colorless. After injecting the fourth quantity, only a small portion of it could be got back, in consequence of the large flakes of lymph, which we suppose the water had stirred up from the bottom of the chest. The tube was plugged and secured in the opening. He complained that it gave him pain; but as it was not severe it was left in its place.

On the following day, however, we learned that the pain in the wound had become so severe that it had been the cause of his passing a sleepless night. The tube was easily withdrawn, and a smaller one of a different shape substituted without pain in its place. By the aid of the syphon between two and three pints of fluid then came away, consisting of matter mixed with the water left behind on the previous day. Some warm water was then injected, but the same difficulty presented itself we had formerly experienced. We could not get the whole of it back.

Accordingly the canula was plugged, but the patient shortly afterwards complained that it was causing pain, which soon became excessive. After vain attempts to give him relief by partially withdrawing it, the pain became so intolerable that he earnestly entreated me to remove the tube. This I was very unwilling to do, but coldness spreading over the body, and a shivering coming on, I was afraid of his falling into a faint, from which it might be difficult to recover him, and I complied with his request. Air immediately rushed into the chest, and he experienced instant relief. The cause of the pain appears to have been, not the tube but the unequal pressure produced by the exhausting apparatus. A poultice was applied to the wound. He soon afterwards fell asleep, and on awaking partook of a hearty dinner.

On the morning of the 24th, we found that tenderness at the seat of the wound during the night had prevented him from enjoying a full amount of rest; nevertheless, he appeared better. His pulse was 104; his appetite good, and his tongue much cleaner. Some opiate pills were ordered to procure sleep. The tube was re-introduced, but on withdrawing the plug a little fœtid air only escaped. It has since remained in the chest, and for about a fortnight a pint of pus was daily discharged; at first partly through the tube and partly by its side, latterly through the tube alone. From that time to the present the discharge has lessened to about one half. For a few days after the air was admitted freely into the chest, the discharge was extremely offensive, but since the air has been again in a great measure excluded, it has lost much of its disagreeable odour.

On the 25th, the third day after the operation, the tongue was perfectly clean. As illustrative of the effect of the operation on his digestive organs, I may mention, that on that day he ate for breakfast two eggs and three slices of bread. At noon he had another slice of bread and a glass of wine. At four, nearly a pound of mutton and a proportionate amount of bread and potatoes, and a pint of water; and in the evening more bread with his tea. His appetite has continued equally good up to the present time.

After a fortnight the porter began to act on his bowels, and the diarrhœa which lasted three or four days before I was informed of it, greatly retarded his progress. His pulse is now a little below 100; his breathing 25; and his strength, which was very much impaired at the time of the last operation, has somewhat increased, notwithstanding the exhausting effect of the discharge and the diarrhœa combined. He usually sits up for three or four hours every day. Nevertheless it must not be concealed that he is very much emaciated, and that any unlooked for addition to the debilitating agents already at work, would place his life in immediate jeopardy. I have good expectation, however, that his strength will increase more rapidly in proportion as the discharge becomes diminished, and that the constitutional improvement will prove more permanent than before, in consequence of the different organs being exempt from that injurious pressure, which, I am satisfied, was the cause of relapse on the two last occasions.

If it proceed, we may hope that while the walls of the right side of the chest collapse over the diminished volume of their contents, that the lung will at the same time at least partially unfold itself, the air gradually penetrate its substance, and absorption go forward in any bands of lymph which may oppose its expansion. It is probably too much to expect that this will take place to any great extent, or that the lung will ever with much efficacy perform its important functions. Nevertheless, what nature is unable to effect on the one side, she will compensate for on the other, and an irreparable injury done to the right lung may be counterbalanced by a fuller development of the left. Thus, after a while, the system at large may not be much a loser.

This. however, will require time; and ere it be accomplished the patient's strength may be found inadequate to the long-continued demand upon it, or some new disease may arise, or some incipient one be matured, to interrupt the work and thwart this desirable end. I am far, however, from regarding the success of the operation as at all dependent on the patient's future progress. We have some reason to expect an ultimately favorable termination (and such a determination, doubtless, would greatly enhance the value of the means mainly instrumental in bringing it about); but should it be otherwise, the great advantage already derived will amply repay us for our trouble, be more than an equivalent to the patient for the trifling suffering by which the benefit was secured, and fully establish the propriety of the operation.

The case appears to me to be chiefly interesting—

1st. On account of the large amount of effusion. The quantity discharged at one time was a gallon, and the whole hitherto cannot be much under five.

2nd. On account of its complication with pneumo-thorax, of doubtful connection with phthisis.

3d. On account of the exceeding mildness of all the symptoms which accompanied the early formation of the matter, constituting what has been termed the latent form of the disease.

4th. As showing the local character of the disease, and the entire dependence of severe constitutional disturbance on the pressure of the fluid, and consequently the inutility of attempting by mere medicinal agents either to cure the one or allay the other.

Lastly. As exemplifying the facility with which, and the extent to which the removal of the fluid may be effected without the admission of air (a matter of much importance in more recent cases where the lung is capable of expanding), and the great and immediate, and possibly permanent benefit which sometimes follows an operation when performed under circumstances apparently very unfavorable.—*Med. Gazette, April* 5, 1850, p, 598.

91.—CASE IN WHICH THE LARYNX OF A GOOSE WAS IMPACTED IN THE TRACHEA OF A CHILD.—By Dr. Burow.

The children in Dr. Burow's vicinity are very fond of blowing through the larynx of a recently-killed goose, in order to produce some imitation of the sound emitted by this animal. When given to them for that purpose, it has usually ten or twelve rings of the trachea connected with it.

A boy, æt. 12, while so engaged (Nov. 1, 1848), was seized with a cough, and swallowed the instrument; a sense of suffocation immediately ensued which was, after a while, replaced by great dyspnœa. Dr. Burow found him labouring under this eighteen hours after, his face swollen, of a bluish-red colour, and covered with perspiration. At every inspiration, the muscles of the neck contracted spasmodically, and a clear, whistling sound was heard; and at each expiration, a hoarse sound, not very unlike that of a goose, was emitted. As, on passing the finger down to the *rima glottidis*, it was found closed, Dr. Burow felt convinced (improbable as, from the relative size of the two bodies, it seemed) that the larynx of the goose had passed through it. Tracheotomy was at once performed; but owing to the homogeneousness of structure of the foreign body and of the parts it was in contact with, the greatest difficulty existed in distinguishing it by the forceps. Moreover, so sensitive was the mucous membrane, that the instant an instrument touched it, violent efforts at vomiting were produced, and the entire larynx was drawn up behind the root of the tongue. At last, after repeated attempts, Dr. Burow having fixed the larynx in the neck by his forefinger, so that it could no longer be drawn up on these occasions, he contrived to remove the entire larynx of the animal. The child was quite well by the ninth day. Dr. Burow says that it was a matter of great congratulation for him that many pupils were present during this operation, and thus able to confirm the correctness of a statement so incredible as to stand much in need of such confirmation. ('Casper's Wochenschrift.')—*Brit. and For. Med. Chirurg. Review, Jan.* 1850, *p.* 260.

ALIMENTARY CANAL.

88.—ON THE TREATMENT OF IMPERFORATE ANUS.—By JOHN ERICHSEN, Esq., Assistant-Surgeon to University College Hospital.

[Almost every case of this malformation will require treatment in some degree special. The following observations of Mr. Erichsen apply to cases in which the anus is imperforate, and the lower part of the rectum absent to a greater or less extent. Mr. E. says,]

In these cases, three courses present themselves to the surgeon. 1st. The colon may be opened in the left iliac region. 2dly. It may be reached in the left lumbar region; and, 3dly. An opening may be made into it through the perinæum.

The only advantage that the iliac incision, or Littré's operation, presents is, that it is an operation easy of performance, and that whether the surgeon reaches the colon or not, he is certain to hit upon some part of the intestinal tube, which may be drawn forwards and opened.

The objections to this operation are, the inconvenient situation of the artificial anus; the great danger that must necessarily result from wounding the peritonæum; the chance of not finding the sigmoid flexure, and, as has often happened, of being obliged to open that portion of the small intestine which first presents itself.

The mortality after this operation is very great. Amussat states, that of twenty-one children thus operated on, only four ultimately recovered; and it is worthy of remark, that all the successful cases occurred in the town of Brest.

The lumbar incision, or Amussat's operation, has not as yet, to my knowledge, been practised on an imperforate child.

The advantages of this operation consist, not only in the artificial anus being situated at a more convenient spot than in Littré's operation, but more especially in the possibility of opening the colon in this situation without wounding the peritonæum.

The objections to this operation, as applied to imperforate children, lie in the frequent co-existence of malformation or malposition of the colon, with absence of the rectum, and in the impossibility, in many cases, of determining, before proceeding to operate, whether the anus is only occluded by a membranous septum, or whether the rectum is absent as well. If it could be ascertained beforehand, that though the rectum be absent, the descending colon occupies its normal position in the left lumbar region, I think it probable that the lumbar incision would be attended with less danger than any other operation that could be practised; but in the absence of this knowledge, it would scarcely appear to be justifiable to have recourse to it, as the colon might not be found, and the anus might merely be occluded by a dense membranous septum.

The perinæal incision has the advantage of being in the natural situation of the anus, and of being easily practised, and perfectly successful in all those cases in which the anus only is imperforate, the rectum being present. It is in those cases only in which there is congenital absence of the rectum that this operation is difficult of performance, and uncertain in its results. If it could be ascertained before proceeding to operate that the rectum be absent, it might be wiser to search for the bowel in the lumbar region. But as the surgeon has no means of ascertaining, before making his incision, whether the rectum be one inch or three inches from the surface, he must cut into the perinæum in order to obtain this necessary information; and if once he has penetrated to such a depth as to get beyond the levator ani muscle, or into the deep fasciæ in this situation, a great portion of the immediate danger of the operation will have been incurred, and few would think it advisable to leave the perinæal operation unfinished, and expose the child to the additional risk of opening the colon in the lumbar region.

There is one point in connexion with the perinæal operation to which it is of much importance specially to attend, not only as respects the immediate resust of the operation, but as regards the ultimate success of the procedure—I mean, the bringing down of the mucous membrane of the gut, and fixing it to the lips of the external wound. Unless this be done, the line of incision between the termination of the gut and the aperture in the integments will degenerate into a fistulous canal, which, like all fistulæ will have a tendency to contract, and will be a source of endless embarrassment to he surgeon and to the patient.

If the mucous membrane can be brought down to, and fixed at the opening in, the integument, this source of inconvenience will be removed, and the patient will be saved all that danger which results from the passage of the meconium over a surface of recently incised cellular tissue. This, however, can only be done when the intestine terminates at a short distance from the surface. If the perinæal incision be two or three inches in depth, there would be little probability of the surgeon being able to bring the intestine down to such an extent.—*Lancet*, *Feb.* 23, 1850, *p.* 236.

83.—ON THE TREATMENT OF INTERNAL PILES.—By Prof. SYME, Edinburgh.

The disease usually called "prolapsus ani," and which is in general attributed to deficiency in the contractile force of the sphincter, depends merely upon a morbid enlargement of the lining membrane of the bowel, which always admits of being easily, safely, and effectually remedied through the use of ligatures. When I began to advocate this mode of treatment—more than twenty years ago—internal hemorrhoids, as the growth in question may more properly be designated, were regarded with the greatest dread as subjects of surgical treatment, hemorrhage from cutting being no less apprehended than the inflammation from tying, so that the late M. Dupuytren felt justified in recommending the actual cautery, notwithstanding all the horrors of its application especially to such a part of the body, as the most expedient means of affording relief from the complaint. The danger of excision has certainly not been overrated, whether the hemorrhage attending it, or, what is still more formidable, the risk of inflammation excited by it, be taken into account. In the latter way valuable lives are lost every year, and the popular dread of interference maintained. But the ligature, when properly applied, is *perfectly safe* and *effectual:* the conditions being, as I have all along explained, that the whole of the diseased growth or growths should be comprehended, and that the threads should be drawn so tightly as not merely to strangle, but completely to arrest all circulation through the hemorrhoidal texture. It may be added, that this method is attended with less pain, either at the time or subsequently, than any of the others which have been proposed. Patients labouring under what is commonly called "prolapsus," may, therefore, be comforted with the assurance, that they may throw aside their uncomfortable bandages, and submit themselves to surgical treatment in full confidence of obtianing complete relief. The true "prolapsus," or descent of the rectum, from weakness of the sphincter, and independently of disease in the coats, is comparatively a very rare infirmity; but, when it does occur, may still admit of remedy, by a different mode of procedure.

J. H., aged 28, was recommended to my care, in the month of November last, by a gentleman who felt interested in his welfare. He had been for a long while in bad health, and had tried a variety of means, with partial relief, but no permanent benefit.

Suspecting from the peculiar complexion of his lips, and countenance in general, that he was suffering from the habitual loss of blood, I asked if he had any protrusion or bleeding from the anus, and was informed that he suffered from both, but had never thought of saying so to his medical advisers, as he did not think there could be any connection between these local symptoms and his general derangements. I urged the propriety of an operation, and, with a view to its performance, sent him to the hospital.

Before taking him into the theatre where my lectures are delivered, I desired the efforts necessary for bringing the whole extent of the disease into view to be made, in order that the ligatures might be applied. But when he presented himself, instead of the hemorrhoidal tumours or tumour which had been expected, the whole rectum seemed as if turned inside out, forming a large cylindrical swelling at least five inches long by ten in circumference, covered with bloody mucus. It was stated that such a protrusion took place every time the bowels were moved, and that the quantity of blood lost was often much more than we had seen. When the bowel had been returned, nothing could be discovered amiss with the anus, except that the skin surrounding it was unusually relaxed, and lay in numerous folds radiating from the orifice. By means of scissors and forceps, I removed the whole of this redundant skin, leaving merely the thin bands that occupied the spaces between the folds, and then desired the patient to maintain the horizontal posture, without any intermission, even for the evacuation of his bowels—in accomplishing which he was especially warned against making exertions.

The protrusion never again appeared, and the patient, after remaining under observation for some weeks in town, returned to the country; whence, in reply to an inquiry as to his present state, he writes to say, that the local complaint is completely cured, and that his general health is greatly improved.—*Monthly Journal, March* 1850. *p*, 242.

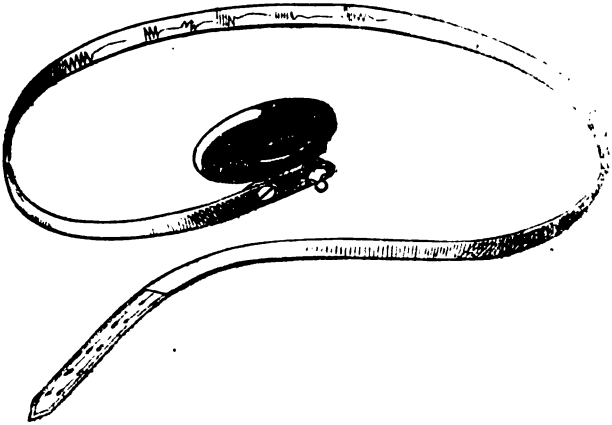
94.—ON CERTAIN INPROVED TRUSSES.—By T. P. Teale, Esq. F.L.S., Surgeon to the Leeds General Infirmary.

[These trusses constructed for Mr. Teale, by Mr. T. Eagland, of Leeds, consist of an *elastic steel girdle*, *a hard pad* of varying form, according to the kind of hernia, and a *spiral spring* acting directly upon the pad; elements, which, existing in various trusses heretofore known, Mr. Teale has now combined in the construction of one. The trusses are thus described:]

The oblique inguinal truss.—The oblique inguinal truss consists of an elastic girdle of steel, to which is adapted a hard pad of oblongo-oval form, acted upon by a spiral spring.

By means of the elastic steel girdle the truss maintains a firm and steady seat upon the pelvis; by the hard pad of oblongo-oval form a firm support is given to the internal ring and inguinal canal, the external ring being left free; and, by the spiral spring, the pressure of the pad is directed perpendicularly upon the part requiring support, during the varied movements of the body. Through the medium of the spiral also, the *degree* of pressure exercised by the pad admits of being modified by tightening or slackening the end of the girdle-strap which is fixed to the button on the pad.

Fig. 1.



The *girdle* is formed of a strip of elastic steel, rather more than half an inch in breadth, and of sufficent length to extend from the pad across the back of the pelvis as far as the haunch of the opposite side, from which point the girdle is prolonged by a leathern belt across the lower and front part of the abdomen, to be fixed to a button on the pad.

Although elastic girdles of steel are now in general use, it is rare to find one, in the various offices of surgical mechanicians, that is not faulty in construction; or, in other words, that secures to the wearer the full amount of benefit that it is capable of affording. The chief error consists in the portion of the girdle which is applied to the back part of the pelvis being made of a *straight* strip of metal bent towards the circular form, and representing a short *cylinder*. The only bearing which such a girdle exerts upon the back of the pelvis is by its lower border; whereas, if the girdle were constructed so as to represent a transverse section of a cone, it would adapt itself to the obliquity of the back of the pelvis, and would thereby secure a bearing upon this part by the whole of its internal flat surface. This advantage is secured, as I have elsewhere* shown at considerable length, by the form given to the steel plate of which the girdle is formed. Instead of being a *straight* strip of metal, the portion which is applied to the back of the pelvis should be cut in the form of a curve, the convexity of which is directed downwards (see fig. 2, *a* to *b*.) When such a piece of steel is bent towards the circular form, it represents a section of a cone, the upper border of which is shorter than the lower, and the flat surface has an obliquity corresponding to the obliquity of the back of the pelvis. The back part of the girdle being thus constructed, the truss is enabled to maintain a firm seat upon the pelvis; but, in order that it may exert a direct bearing upon the inguinal canal, it is necessary that the anterior portion of the steel girdle, which extends from the haunch to the pad, should describe a moderate curve with the convexity upwards (see fig. 2, *b* to *c*) By bending this portion of the elastic girdle towards the circular form, its internal or applied surface acquires an obliquity facing upwards and backwards, and in this direction it exercises its pressure upon the pad.

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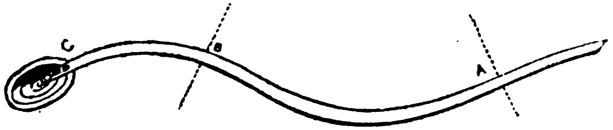
* Practical Treatise on Abdominal Hernia, by Thomas Pridgin Teale.

FIG. 2.



This form of elastic girdle was adopted bv the late Mr. Eagland, of Leeds, and has been used by his sons, Tr. Thomas Eagland, of Leeds, and Mr. Edwin H. Eagland, of London. I have seen trusses similarly constructed by other instrument makers; but in too many instances, even in the present day, a straight strip of metal is the form of steel girdle employed.

The steel girdle is covered with leather, silk, or calico, and is slightly wadded on its internal surface.

The *pad*, for ordinary cases of oblique inguinal hernia, should be of an oblongo-oval form, two and a half inches in length, and one inch and three-quarters in breadth. Ivory is the best material, being susceptible of a high polish, and being also a good conductor of heat, on which account it is cool to the wearer. In hospital practice, where the cost of the instrument is an object, a pad of box-wood steeped in linseed-oil may be substituted for it, or a boss of thin metal covered with a layer of leather. In young subjects, whose muscles are powerful, the pad should be of smaller size and greater prominence, for in them a more concentrated pressure is required. In old persons, whose muscles and aponeuroses are feeble, the pad should be larger and flatter. If the hernia has considerably dialated the inguinal canal, a pad of greater breadth and less convexity is to be used. When the posterior wall of the inguinal canal has been so much encroached upon, in consequence of the large size and long continuance of the protrusion, that the hernia is apparently direct, the form of pad hereafter to be described as applicable to direct inguinal hernia should be employed. The pad must be hollowed on its external surface, for the double purpose of giving it lightness and of allowing a recess for lodging the spiral spring when pressed home.

The *spiral-spring* placed between the anterior extremity of the steel girdle and the pad, is made of steel wire thickly, electro-plated; or, where the cost of the instrument is an object, varnished. The form of the spiral in the inguinal truss is oval, adapted to the form of the pad.

The terminal coil of the spiral, which is attached to the pad, is received into a narrow groove prepared for it in the concave surface of the pad. This mode of attachment between the spiral and the pad renders any other fastening unnecessary. An uniform pressure throughout the whole extent of the pad is thus obtained; and the spiral, acting as a universal joint, allows the girdle to adapt itself to the varying movements of the body without disturbing the pad.

The measure for this truss is taken by passing a string from the internal ring round the pelvis to the same point, care being taken that the course of the string is directed on each side along the depression between the trochanter and the crest of the ilium. The mechanist, in constructing the truss, allows one inch of additional length to compensate for the space occupied by the wadding. When a double truss is required, in addition to measuring the circuit of the pelvis it is necessary to note the distance from the internal ring on one side to that on the opposite.

The direct inguinal truss.—For the support of a direct inguinal hernia, or of an oblique inguinal hernia, which from long continuance has simulated the direct, it is necessary that the pressure of the truss should be chiefly exercised over the external ring. For this purpose a truss may be employed similar to the former, but with an egg-shaped pad, the larger extremity of which lies towards the pubes. In ordinary cases the pad may be two inches and a half in length, and one inch and a half in breadth, towards its pubic end. The degree of prominence of the pad should be adapted to the particular case.

The spiral in this truss is circular, and is attached so as to act chiefly upon the pubic end of the pad.

The femoral truss.—The femoral truss, like the former trusses, consists of an elastic girdle of steel, and a hard pad of special form, acted upon by a spiral spring.

The elastic steel girdle is similar to that described for the oblique inguinal truss, except that its anterior portion, which extends from the haunch to the pad, should sweep in a course somewhat more descending. This portion of the steel girdle is usually about one inch shorter than in the inguinal trusses.

The pad of ivory, box-wood, or thin metal covered with leather, is of a triangular form, the upper border corresponding in its direction with Poupart's ligament, and the pubic border being parallel with the femoral vessels. The size of the pad which has been found best adapted to the generality of cases is one inch and one-third in the vertical direction. The greatest prominence of the pad should be near its upper and pubic angle, so that its pressure may be chiefly exercised upon the pubic compartment of the femoral sheath, immediately below Poupart's ligament. The proper form is given to the pad by slightly bevelling the upper and pubic edges, and by more freely bevelling the lower or iliac edge, the angles and apex formed by the union of these planes being freely rounded off. The pad should be hollowed on its external surface. The spiral spring, which in this truss is of a circular form, is attached towards the upper and pubic end of the pad, so as to act more especially on its most prominent part.

A pad thus constructed gently closes the external aperture, namely, the saphenous opening, but its chief pressure is directed to the pubic side of the femoral vein. The large vessels are thus subjected to as moderate a degree of pressure as is consistent with the support of the hernia, and the pressure is concentrated upon the part which more especially requires support. It is of the utmost importance that the pad of the femoral truss should be of *small* size. If its dimensions materially exceed those stated above, the pad is constantly liable to displacement from the action of the psoas and iliacus muscles on one side, and the pectineus on the other.

The hard pad and spiral spring are equally applicable to the umbilical and other trusses.—*Med. Gazette, Feb.* 1, 1850, *p.* 194.

35.—CASE OF INTESTINAL OBSTRUCTION, FOR WHICH AN OPERATION WAS PERFORMED.—By JOHN ERICHSEN, Esq., Assistant Surgeon to University College Hospital.

[The reader will find the subject of intestinal obstruction, with the question of the propriety of operative interference, fully discussed in 'Retrospect' Parts XVII and XIX, in observations by Mr. Phillips, Mr. Hilton, Dr. Bright, and others. We quote now an interesting case by Mr. Erichsen, in which the abdomen was opened in the median line, and the obstruction was relieved; though, unfortunately, the case terminated fatally. The patient was of the male sex, 52 years of age, and of spare make. The general symptoms were of the usual kind—pain, ditsension, complete obstruction, fæculent vomiting, great general distress, &c. The attack commenced on the 6th of January, and Mr. Erichsen was sent for on the 12th, Drs. Bentley and Peacock having been in assiduous attendance in the mean time, and having tried all the usual means. An operation having been determined on, the question was, whether to make an atificial anus according to Amussat's plan, or to open the abdomen in front, and seek for the obstruction; and as the symptoms did not point distinctly to the large intestine as being the seat of obstruction, the latter alternative was adopted. Accordingly, at 9 A. M., on the 13th instant, chloroform having been administered, Mr. Erichsen, proceeded to operate. Mr. E. thus describes the operation, and the subsequent progress of the case:]

Taking my stand between the legs of the patient, an incision was made from the umbilicus to within an inch of the pubes, as nearly as possible in the mesial line. Owing to the unequal tension of the abdominal parietes, the sheath of the left rectus was slightly opened; a small incision was then carried through the linea alba, and the peritonæum carefully opened. This membrane was then slit up on a broad director, to an extent corresponding to that of the external incision. Immediately, on this being done, large round coils of tensely distended intestine, tolerably healthy in appearance, being but slightly injected, protruded through the aperture, curling over its sides, and overlying the abdominal walls. The intestines pressed forward so forcibly through the aperture, that it was found necessary to enlarge the incision upwards in order to admit the hand, to make a proper exploration of the contents of the abdomen. This was accordingly done, to an extent of about one inch and a half above the umbilicus, by means of a probe-pointed bistoury, guided by the forefinger of the left hand. A careful search was now made for the seat of obstruction.

Lying directly across the line of incision, from left to right, was seen a long coil of contracted and empty intestine, that was recognised with some difficulty, on account of its abnormal situation, to be a portion of colon. It was contracted, and apparently contained neither fæces nor flatus being perfectly empty. On this being drawn to the left side, the transverse colon and cœcum, greatly distended, were brought into view, as well as numerous coils of tympanitic small intestine. From the distention of the small intestine, of the cœcum and the transverse colon, it was evident that the cause of obstruction existed at some point below the termination of the transverse colon. The distended small intestine was therefore drawn to the right side, and a careful examination of the left side of the abdominal cavity proceeded with.

On passing the hand into the left lumbar region, it was found that the distension of the transverse colon suddenly ceased here, and I found it impossible to trace clearly the continuity between the transverse and descending portions of the colon. The sigmoid flexure of the colon formed a long convolution, stretching from the left lumbar region downwords, and across the abdomen to the right of the umbilicus; it then made a sharp curve, passed above and somewhat behind the apex of the bladder, raturned to the left lumbar region, and then terminated in the rectum. This convolution, which was long and floating, stretched therefore across a portion of the abdomen, obliquely from left to right, and lay before and to the right side of the rectum. The whole of this portion of the colon, as well as the rectum, was contracted and perfectly empty, forming a striking contrast with the condition of other portions of the intestinal canal. It was now evident that we had to do with a case of volvulus, dependent upon a preternaturally elongated sigmoid flexure of the colon, making a half turn upon itself, by falling over towards the right side, so as completely to occlude its calibre, where it was tightly bound down in the left lumbar region by the reflected peritoneum.

An attempt was now made to rectify this volvulus, by drawing the elongated colon to the left side, and pulling it downwards, at the same time that an O'Beirne tube was passed up the rectum. There was some difficulty, even when the abdomen was opened, in working the tube inch by inch, and by drawing the intestine over its point, along the double curve formed by the elongated colon; but this was at length effected; the twist was obliterated, and flatus passed through and by the side of the tube. The intestines were now replaced, and a number of points of interrupted suture were inserted, bringing the edges of the incision into close approximation. Long strips of adhesive plaster were placed across the abdomen, which was further supported by a napkin pinned tightly round the body. The patient, who was a good deal exhausted by the operation, which had lasted about an hour, was then put to bed, and had two grains of opium administered. He remained tolerably quiet, free from sickness and uneasiness, until 5 P. M., when he passed a fluid feculent motion, with much flatus. This gave him considerable relief, and he spoke cheerfully of his condition. He had taken some beef-tea, during the day, which he retained on the stomach, there having been no return of the vomiting after the operation.—Eight P. M.: He passed another fluid, feculent, and copious motion; expressed himself much relieved, but almost immediately afterwards sunk back on the pillow and expired.

Examination of the body twenty-five hours after death.—(Present Dr. Peacock and Mr. Filliter.)—On opening the abdomen, the peritoneum lining the interior abdominal wall was found roughened and injected; a small quantity of sanguinolent serum was contained in the cavity of the abdomen. The stomach was of unusually large size, but healthy. The small intestines were slightly inflamed in patches on the serous surface. On laying them open, they were found to be pervious throughout, but contained a quantity of viscid, tenacious, grey mucus, identical with that which had been vomited. The mucous membrane was healthy. The cœcum and transverse colon presented a remarkable contrast to their appearance during the operation, being now empty and comparatively contracted. The sigmoid flexure of the colon was healthy, as far as its structure was concerned, with the exception of being perhaps slightly thickened. The same remark applies to the rectum. The elongation of the sigmoid flexure was now well seen, as it hung downwards before and to the right of the rectum; it was loose and floating in the cavity of the abdomen, having a long mesocolon. It presented three sharp curves or angles—one at the junction of the transverse colon with the descending convolution; the second, at the junction of the descending and ascending convolutions; and the third, at the point where the ascending convolution terminated in the rectum. The seat of obstruction, which was now, however, entirely removed, had been at the first of these curves,—viz., the junction of the transverse colon with the descending convolution. The mechanism of the obstruction was obvious. The end of the transverse colon was tightly bound down to the abdominal wall, in the left lumbar region, by reflected peritoneum, and this part, firmly and immovably fixed, terminated at an acute angle in the loose, and floating, and preternaturally elongated sigmoid colon. So long as the convolutions of the sigmoid colon hung downwards and to the left side, there was no difficulty in the passage of fæcal matters into them from the transverse colon; but if the sigmoid convolution were tilted over to the right side, and at the same time thrown slightly upwards, that portion of the colon which remained firmly fixed in the left lumbar region became occluded by the twist that was occasioned by the tilting of the elongated sigmoid flexure. The length of the large intestine, from the cœcum to the anus, was six feet ten inches. The cœcum, transverse colon, and rectum, were of their normal length, the preternatural elongation being confined to the sigmoid flexure of the colon. Both kidneys were found in a state of granular degeneration. The other abdominal viscera were healthy.—*Lancet, Jan.* 26, 1850, *p.* 108.

96.—ON ASCENDING OR INTERMUSCULAR HERNIA.—By James Luke, Esq., Surgeon to the London Hospital.

There is a variety of inguinal hernia apparently not generally known to surgeons, which I venture to designate as ascending or intermuscular, (for reasons which will appear in the sequel,) to which I am anxious to draw attention, from the circumstance that it is liable to cause some difficulty in diagnosis, and, when strangulated, to become a matter of more than usual interest and occasional embarrassment.

To illustrate the subject, it is proposed to relate a few cases, which partake of the same general character, although they exhibit modifications of sufficient interest to be noticed in the description. Before relating those cases, I propose to give some account of the form of hernia to which they relate, that a clearer understanding of its mode of formation may be obtained. In doing so, it will be needful to recall to the recollection of the reader the relations which a hernia, in the most common form, bears to the inguinal rings and canal through which it descends, because the immediate subjects of this communication are examples merely of deviations from those relations.

It will be remembered that an inguinal hernia of the ordinary kind, after issuing from the abdomen through the internal ring, *descends* in the inguinal canal in front of the spermatic cord in the male, and of the round ligament in the female, from whence it passes through the external ring to the scrotum in the former, and the pubes in the latter.

A hernia, however, at its exit from the abdomen, is liable to be pushed aside, or have its course altered, by any opposing obstacle; for its tendency is always to pass in that direction in which it meets with least impediment to its course. In the cases before us such impediments do occasionally arise, and more particularly in the female; a circumstance attributable to the lesser anatomical development of the canal and external ring in that sex, from which probably proceeds the more frequent occurrence of the form of hernia mentioned below. In the male sex the canal and rings are sufficiently large to allow of a hernial descent, so that we continually observe that the direction of an inguinal hernia in the male is downwards, unless it be turned aside or its direction altered by artificial means, and especially by the pressure of a truss. In the female, however, natural obstacles occur in the downward direction; it therefore sometimes happens that the lesser impediments to the progress of a hernia lie in an upward or outward direction, in which case the tumor, after passing from the internal ring, turns towards the ilium, and becomes interposed between the layers of abdominal muscles above and on the outside of the ring. Such herniæ are covered anteriorly by the internal oblique muscle, and bear nearly the same relation to the tegumentary surface as an ordinary hernia confined to the inguinal canal, but differ materially from it in its relation to the internal ring. The tumor lies nearer to the ilium in this form of hernia, in a position which, being not usually occupied by hernia, may give rise to some difficulty in diagnosis, and may through inadvertence be mistaken for some other disease, either of the cœcum on the right, or colon on the left side. It also lies somewhat buried, when small, under a covering of muscular structure, and occasionally under an accumulation of adipose tissue, and may on that account be passed over altogether without notice. In its position it constitutes the kind of hernia which I have named above.

[Mr. Luke then relates three cases of this form of hernia which have come under his observation. In two of these cases Mr. Luke operated for strangulation; and in the third case the hernia was found, on the post-mortem examination of a case for which the ordinary operation had been unsuccessfully performed. In all these instances the patient was of the female sex. Mr. Luke proceeds to observe:]

These cases, even in the female, are unfrequent; they are still more so in the male, and, I believe, never occur in that sex unless produced by means wholly independent of anatomical formation and development. They may, however, be produced by other causes; and the subject has an important bearing upon the application of trusses to the relief of the ordinary kinds of inguinal protrusions. From the manner in which a truss is usually applied, and from the sufficiency in the size of its pad, both the internal and external inguinal rings are guarded, and the more especially when the two are approximated by the descent of the former, as is common in old hernia. But in an incipient hernia, when the rings are in their normal position, or nearly so, a truss may be so applied as to guard the external ring and lower part of the inguinal canal only. In that case the hernia is not prevented from protrusion through the internal ring, and its increase in size may continue, notwithstanding this imperfect use of the instrument. If such increase does take place, the truss has no other effect than to alter the course of the hernia by preventing its *descent* through the canal and external ring, and constraining it to take that direction which alone is open to it. That direction appears to be upward and outward; and thus the intermuscular hernia, as described above in the foregoing cases, is produced. To prevent such a form of hernia in a male, arising from the use of a truss, is an important desideratum, and appears easily attainable by its proper application. As the occurrence is the result of pressure of the pad upon the lower part of the canal and external ring, while the internal ring remains unguarded, there are two courses open for selection. The one course is to remove the pressure of the truss altogether, by which means the hernia will have an opportunity of descending in its usual course: the other is to guard the internal ring also, and to prevent protrusion from the abdomen altogether. Of the two, it need scarcely be observed that the last is to be preferred. Although this is generally done, it is not always so; and it may serve a good purpose to show what may take place, and what has taken place, from inattention to this deficiency in the application of trusses. They should always be so applied as to guard the *internal ring.*

An illustration of the above came under my notice a short time since, in the case of a gentleman, about 50 years of age, who first applied to me in consequence of some uneasy feelings which he experienced in the abdomen, and irregular action of the bowels, attended by occasional flatulence and nausea. He also complained of pain in the region of the cœcum, in examining which and the adjacent part it was found that he was the subject of hernia. This had descended partially into the scrotum; but he had been in the habit for some years of retaining it by means of a truss. A much larger tumour occupied the space between the crest of the ileum and the usual seat of the internal ring, which, by the communication of impulse, was ascertained to be connected with the lower tumour. Thus it was found that the entire hernial sac was of very considerable dimensions, and contained a large mass of viscera. Probably to this circumstance was referable the symptoms of intestinal derangement which were the immediate cause of his application. It became, therefore, an object of primary importance in the treatment, that the contents should be replaced within the abdomen. In the attempt to accomplish the reduction the lower tumour was readily made to disappear; but, as it did so, the upper tumour became more full and large. Attempts at reduction of the upper tumour in the upward direction were wholly unavailing; but, when pressure was made upon it in a direction downwards, in the course of the inguinal canal, while the other hand was kept upon its lower extremity, so as to prevent the contents from descending through the external ring, it was, by a little manipulation, partially returned into the cavity of the abdomen. Old adhesions of the contents, either to each other or to the sac, appeared to be the obstacle to the reduction being complete. Sufficient, however, was accomplished to afford some relief to the patient, and the intestinal disturbance became less severe. Should strangulation occur in this case, the circumstances which complicate it are well calculated to try the skill of the most experi-

-enced surgeon who shall undertake an operation for its relief; all which complication, with all its present ills and prospective embarrassments, I think, might have been prevented by the proper use in the right position, and at an early period, of an efficient truss.—*Med. Gazette, March* 15, 1850, *p.* 458.

97.—CASE OF HERNIA REDUCED EN MASSE.—By JAMES LUKE, Esq., Surgeon to the London Hospital.

[The patient, a gentleman, æt. 77, was seen by Mr. Callaway on the 30th December, when he was suffering from vomiting, which he attributed to an error in diet three days previously. Mr. Callaway ascertained that the patient had been the subject of hernia, and that the hernia had descended on the 25th, and had been pushed up without difficulty. As no tumour could be felt, suitable medicines were prescribed. On the 1st January, no relief had been obtained, but the vomiting had become stercoraceous and hiccough had supervened. Mr. Luke gives the following further account of the case:—]

At this period, about ten a. m., I first saw the patient in consultation, at Mr. Callaway's request. He was then much exhausted, and his pulse low. He was rejecting everything from his stomach, and was suffering from a peculiar kind of hiccough. I found the abdomen, as stated above, free from tympanitis, and pressure could be borne without inconvenience over the whole surface. A slight sensation of pain was caused by pressure above the left inguinal canal, but the most careful examination failed to detect any tumour or fulness within the abdomen or within the canal. On attending to the condidition of the external ring and spermatic cord, important information was obtained. The ring was found sufficiently large to admit the point of the finger readily within it, while the cord, as it passes through, as well as below, the ring, *was clearly defined, and unobscured by any overlying hernial sac.* These circumstances led at once to the conclusion that the sac, which the previous history had informed us to have been present at no very distant period with the hernia when it descended, had been displaced from its former position, and had been returned into the abdomen, together with its contents. Thus a high presumption at least was established, that the hernia had been reduced en masse, while the existing symptoms justified the further conclusion that the hernia was in a state of strangulation. Supposing that we had sufficient data from which to form a correct opinion, we agreed to recommend an exploring operation, provided relief should not be obtained before three o'clock, at which time we proposed to meet again. In the meantime, calomel and opium were ordered.

At three o'clock the hoped for, rather than expected, relief had not been obtained, although the sickness had not been so urgent; but the exhaustion had increased.

The operation was now proposed and urged upon the patient, but his assent was steadily and perseveringly withheld, and much time was devoted to overcome his objections.

We again met at 10 p. m., and again urged the importance of avoiding delay, but with a result similar to the last.

2d. During this day Mr. Callaway continued his attendance alone, in the latter part of which the exhaustion became much increased, and tympanitis made its appearance. The sickness, however, had ceased, but the constipation continued. At ten o'clock I again attended, having been informed that our patient would then consent to have the operation performed, as we had proposed, provided some castor oil which he determined to take in the afternoon should not have previously acted on his bowels. On examining the inguinal rings at this period, there appeared to be a slight tendency to hernial protrusion both on the right as well as on the left side, but on neither side was there any pain on pressure. Previous to this time attempts had been make to reproduce a hernial descent, by directing the patient to cough, strain, walk about the room, without any hernia appearing, and upon this occasion the slight fulness rather than tumour at the internal abdominal rings on both sides receded immediately under the pressure of the finger without pain. As the caster oil had not acted on the bowels, after some further delay the requisite consent was obtained, and the operation proceeded with by pinching up a traverse fold of skin over the inguinal canal, and transfixing it with a knife in the ordinary way. This laid bare the abdominal tendon over the canal, on incising which the canal itself and spermatic cord were exposed

At this period a small tumour presented itself at the internal ring, and became larger, or rather came more into view, as the incisions of the ring gave more freedom to it. The tumour was rounded in form and of a white appearance, but seemed to contain some dark substance within it. When a small opening was made into it, there issued some bloody serum, and when it was more freely opened, a portion of the discolored intestine was brought into view; the discoloration, however, was not very great. A finger introduced along the surface of the intestine passed evidently into a hernial sac, at the upper part of which, and about two inches from the internal inguinal ring, a contracted part was detected encircling and strangulating the intestine. This contraction or stricture was clearly produced by the neck of the sac, but was not very tight. The point of the forefinger with some little difficulty was introduced within its grasp, and served as a director on which it was divided readily with a probe-pointed bistoury. After this was accomplished the intestine was carefully and easily reduced from the sac into the general cavity of the peritoneum, and the wound closed by two sutures, plaster, and bandage.

Ordered beef-tea in very small quantities at a time; opium if sickness should supervene. But if no sickness took place after the lapse of three or four hours, small doses of sulphate of magnesia, in peppermint water, were to be given, and repeated every three hours until the bowels were relieved.

3d. There had not been any sickness, and the bowels had been freely open very shortly after the operation. Neither of the medicines ordered the evening before had been taken. There was some tympanitis and a continuation of the hiccough, but both were diminished. The exhaustion was also less. Ordered, more nourishment and some bottled stout.

4th, 5th, 6th. On these days there was gradual improvement in all particulars. The bowels had acted well, and the tympanitis and hiccough had passed away. On the 6th the wound was dressed and found to be nearly healed by adhesion. The sutures were removed.

8th. The patient thought the wound was healed, and the dressings were not changed. On this day, as he appeared convalescent, I ceased attendance.

[Mr. Luke states that this is the eighth case of reduction *en masse* which has fallen under his notice; and records his opinion that "hernial reductions *en masse* have been far more frequent than operations for their relief." He says:]

The importance of the above does not, however, depend so much upon the addition which it makes to the number of successful cases, as upon the clear and valuable light which it throws upon the diagnostic marks which distinguish such reductions en masse. In its perusal it will be observed that some difficulty was experienced, both by Mr. Callaway and myself, in obtaining a clear and satisfactory history, in consequence of the notion which the patient entertained that the hernia had nothing to do with his existing condition, while the same idea influenced his refusal to submit to the proposed operation. We had, therefore, in more than an ordinary degreee, to depend upon the local signs for the diagnosis which justified our proceedings. The first and important material fact in the history which was clearly made out, was the previous existence of a reducible inguinal hernia on the left side; and less clearly, that it had been down five days before Mr. Callaway saw the patient, and had been then easily reduced. The point to be determined was, whether those local signs which usually remain after an ordinary reduction, still continued in the case under consideration, or had been removed by the easy reduction alleged to have been made. The local examination satisfied our minds that they had been removed, and hence our conclusion upon the case. The signs alluded to, are, the obscurity of the ring and spermatic cord, particularly of the last, caused by the continued presence of sac. Had the sac continued as in ordinary reduction, the fact would have been known by the obscurity of the cord, which it overlies—and the inference would have been drawn that the hernial contents had been reduced without the sac being reduced at the same time. But as no obscurity existed *after* the previously-ascertained descent of an hernia, the conclusion that the sac also had been reduced, together with its contents, seemed the only proper one to be drawn from the premises. The existing symptoms of intestinal obstruction also pointed to the high probability of strangulation being present, although the circumstance of almost immunity from pain at the part might have led to error if previous experience had not informed me in how mitigated a degree this symptom might appear, even when severe strangulation existed.

Mr. Reid, of Canterbury, among many judicious remarks appended to a case of partial reduction en masse, published by him in the 'Provincial Journal,' observes—"The existence of deposition of fat in the cord often placed at the external ring, cysts of the cord, and varicocele, would cause a fulness and obscurity about it which could not be distinguished from that occasioned by the sac, with or without some portion of its contents." In these observations Mr. Reid is correct only in supposing that fat and cysts connected with the cord and varicocele produce obscurity of the cord, but he is not correct in asserting that obscurity from these causes cannot be distinguished from those arising from the presence of hernial sac, with or without some portion of its contents. It will be recollected that all the causes of obscurity referred to, other than those from sac, are intimately connected with the cord; inded, so intimately as to follow all its movements. The hernial sac, however, does not obey the movements of the cord, and the difference in this respect affords a ready means of distinguishing the sac, when present, from those other causes of obscurity. The testicle, when drawn downwards, will be followed by the cord. The cord, in descending, carries the bodies which are intimately connected with it; but the descending cord does not much, if at all, affect the hernial sac.—*Med. Gazette, Feb.* 8, 1850, *p.* 236.

98.—CASE OF INTERNAL STRANGULATED HERNIA, FOR WHICH AN OPERATION WAS PERFORMED.—By Prof. SYME, Edinburgh.

[In connection with the above case, the following by Mr. Syme will be interesting.]

Upon the 13th of October last, I was asked by Mr. Sidey and Dr. Newbigging to see a patient, who appeared to be suffering from an internal strangulation of the bowel.

He was a man of about fifty-five years of age, the butler of a family in town; stout in frame, and rather corpulent. For eleven years he had been troubled by an inguinal hernia of the right side, and had worn a truss to prevent its protrusion, until the last six weeks, during which he had not observed any swelling, although the bandage had not been used, in consequence of five months having elapsed without any appearance of it. At twelve o'clock of the preceding night, he had suddenly felt very ill, and sent for Mr. Sidey, who saw him at one o'clock in the morning, complaining of intense abdominal pain, with quick pulse, cold perspiration, and vomiting. Upon careful examination, a tumour, about the size of a hen's egg, was felt in the right iliac region, without any external enlargement or thickening of the parietes of the cavity. Leeches were applied and several injections administered during the night, with some palliation, but no material alteration, of the symptoms, which continued much the same as they have been described until we met about two o'clock in the afternoon—fourteen hours from the commencement of the attack.

As there could be no doubt that strangulation of the bowel existed, we examined the suspected region with all the care in our power, but, probably from the abdomen having become more distended, without being able to detect the tumour which had been felt the night before. All that we could perceive was a slight degree of induration or resistance, opposite the internal ring, over a space not much larger than the point of a finger. In these circumstances, I should not have felt justified in undertaking any operation, unless Mr. Sidey's accuracy of observation had been well known to me, and, in absence of any positive information that could be obtained at the time of our examination, rendered his detection of a tumour in the first instance sufficient ground for surgical interference.

Having placed the patient in a convenient position, I made a free incision of the integuments throughout the whole extent of the inguinal canal, tied the superficial epigastric artery, which had been cut, inserted my finger through the external ring, and guiding upon it a probe-pointed curved bistoury, divided the aponeurosis of the external oblique, up to the internal opening for the cord. There being still no appearance of a tumour, but a more distinct feeling of resistance. I divided the other coverings of the cord, and brought into view a dark-colored mass, at the internal ring.—Pulling this toward me, I readily drew out a hernial sac, about the size of a hen's egg, which, being opened, was found to contain a portion of the small intestine. Searching for the stricture, I encountered a difficulty from the sac yielding to the slightest pressure, and returning with its contents into the abdomen. I therefore seized it with a pair of forceps, and thus obtained the requisite tension, until I succeeded in passing the edge of my nail beyond the stricture, and guiding the bistoury upon it, effected the dilatation necessary for accomplishing reduction of the strangulated part. The patient was speedily relieved from all his distress; and, although a very unfavorable subject for any operation, through the kind and judicious management of Mr. Sidey, recovered completely, and is now quite well.

There seems to be considerable difficulty in satisfactorily accounting for the strangulation. It was evidently caused by the neck of the sac; but whether the hernial pouch had remained empty until the symptoms were produced by the entrance of intestine, or whether the contents had previously been a state of incarceration, is a question that admits a difference of opinion. Mr. Sidey informs me that, about three weeks before the operation, the patient suffered for two or three days from colic pains, but not of such a character as to suggest the suspicion of hernia; and the stricture was so extremely tight that I can hardly suppose the intestine could have been imprisoned, without affording signs of being so.

This case will, I trust, afford encouragement to operate for the remedy of hernial tumours, reduced in a state of strangulation; and may also be regarded as possessing some interest from being, so far as I know, the only instance of recovery from a hernia which has become strangulated within the abdomen.—*Monthly Journal, Jan.*, 1850, *p.* 1.

99.—ON THE OPERATION FOR STRANGULATED HERNIA.

[A writer in the 'British and Foreign Medico-Chirurgical Review,' criticising Mr. Hancock's pamphlet on this subject, (see 'Retrospect,' vol. xx. p. 157,) thus states the points at issue in the controversy:]

The most usual mode of performing this operation is, by laying open the peritoneum which forms the sac, and then dividing the stricture. For reasons to be presently stated, some surgeons have thought right to deviate from this practice, and to adopt, as a general rule, the division of the stricture external to the sac of investing peritoneum, which surrounds the strangulated gut or omentum. This plan has received the distinguishing appellation of Petit's operation; though it dates its origin to a time prior to its advocacy by that surgeon. The question is, which of these two modes of practice is to be adopted as the *general rule:* and it is right that we should here at once add, that the supporters of the 'new style' are not *exclusives;* though many who give a preference to the old plan, do so to the entire exclusion of the new. Our author belongs to the latter class. The question is, doubtless, one of grave importance; and the innovation (if we may so term it) has been countenanced by many good surgeons, who have had large personal opportunities of testing its value. It is not, however, so much of an abstract question as, at first sight, it might appear. The information we require is, which is the safer operation in the hands of the many: and in the multitude are, of course, included those whose personal experience is comparatively limited, and who, therefore, cannot be expected to apply those delicate tests in the diagnosis of individual cases, which such men as Mr. Key and Mr. Luke could do. We believe, in short, that the operation without opening the sac may be regarded as the preferable alternative by surgeons of large experience, who are fully alive to the fact that, in the ordinary routine of practice, the exceptions may embrace a much more numerous class of cases than the rule; but we have as little hesitation in regarding the older plan of opening the sac in all cases, as a more certain and less dangerous course, to be pursued by surgeons, to whose lot it falls only occasionally to perform this serious though simple operation. This view has not been taken by writers on the subject, who have treated it as involving only the abstract question of which is the preferable method as a general rule of practice; and the advocates of each plan have considered that their statistics have borne out their several opinions. A review of these and of the whole subject, has satisfied us that the consideration we have just pointed out constitutes, in a practical point of view, an important element in discussing the question.

[The writer proceeds to state the objections to the ordinary operation:]

Peritoneal inflammation consequent on exposure and handling of the contents of the sac, and admission of air into the serous cavity; hemorrhage; risk of wounding the intestine, or of rupturing it by drawing it down to examine its condition at the seat of stricture; extreme prostration; danger of disorganization from exposure.—The validity of these objections, as a whole, is first questioned by Mr. Hancock, who regards the exaggeration of the danger attending the usual operation by the advocates of Petit's method, as fraught with mischief; inasmuch as it tends to perpetuate the system of delay which has acted so prejudicially in augmenting the calendar of fatal cases. In this opinion we concur. Simple delay each hour diminishes the chance of the patient's recovery; and when we have superadded to this negative cause, the positive injury done to the intestine by violent and prolonged taxis, with the additional agency of stimulant cathartics upon the mucous and muscular coats of the bowel, we may fairly anticipate that the "last resource" will fail. In this respect, then, we think it is a favourable point in the newer operation, that it induces the surgeon to propose, and the patient to submit, at an earlier period, to operative interference; and if the operator be only prepared, by previously acquired tact and knowledge, to discriminate whether it is safe to complete the operation without opening the sac, he may safely adopt Petit's method as his general rule; always bearing in mind as we have already remarked, that the exceptions to such rule are very numerous. Mr. Key attributes the usual fatality of the ordinary operation to exposure of the inflamed or strangulated portion of bowel. Mr. Hancock says, that comparatively few patients die of simple peritonitis after this operation, and supports his opinion by referring to his own experience, with statistics, adduced (for other purposes) by Mr. Gay, and by the fact that the "amount of mortality is not in the same ratio as the extent of intestine exposed." It is quite true, that small herniæ excite generally, the most urgent symptoms; but this is because they are generally recent, and the ring through which the gut descends is contracted; the stricture, in consequence, is generally tighter in these cases, and the intestine more susceptible on its first protrusion. We do not, therefore, attach much weight to this remark of our author. But it is certainly true, that a large old hernia may be often exposed and roughly handled, without the same risk which attends a similar exposure of one of recent descent; and, for this and other reasons, we are disposed to regard Petit's operation as more applicable in recent than in old ruptures. There is less propability of adhesion on the one part, and less risk from exposure of the contents of the sac on the other.

Again, is the incision of the peritoneum fraught with the risk attributed to it. Mr. H. thinks not, when the serous membrane is already in a diseased condition; and considers that the position is proved by the impunity with which the large abdominal sections for ovariotomy are made. The operation for paracentesis abdominis, and the removal of large portions of omentum, are also regarded as affording confirmatory evidence on the same point. We are not prepared to go the full length with Mr. Hancock in this opinion. If inflammation is less likely to occur in some of the instances he has adduced, it is rather because the system generally is less prone to destructive forms of inflammation when partially prostrated by disease, than where the frame is suddenly subjected to a severe injury, involving an important serous membrane, such as is the peritoneum. But, be this as it may, we have no hesitation in ascribing infinitely more importance to the prolonged pressure by the ring of stricture upon the strangulated intestine, than to the small and clean incision which is required to liberate the gut; and, if there be no unnecessary handling, the general sac of the peritoneum need be very little interfered with.

[The following are given as the most important of Mr. Hancock's deductions:]

"1. That opening the sac does not increase the danger of the operation, but it is to be preferred as the safer mode of proceeding. 2. That comparatively few cases die of simple peritonitis after the ordinary operation. 3. Incisions made into the peritoneum, with a view to relieve an inflamed condition of that membrane, are calculated to diminish, not augment, the inflammation. 4. Rapid depression of the vital powers, with death, are not to be attributed to opening of the sac 5. The risk of wounding the intestine is less in the usual, than in Petit's operation. 6. Petit's operation not being applicable to all cases, exposes the patient to the danger attending error of selection. 7. The practice of exhibiting purgative medicines before operating for strangulated hernia, with a view to the liberation of the gut by its own movement, is improper. 8. The successful cases treated by Petit's operation would have been equally successful under the usual treatment; a very large number of those in which it failed might have been saved, had the sac been opened. 9. The employment of chloroform should supersede the necessity of warm bath, bleeding, and tobacco, in the treatment of strangulated hernia. 10. The injurious effect of purgative medicines, after the operation for strangulated hernia, are shown by the increased urgency of the symptoms, and the fatal results attendant upon their exhibition."

These, (says the reviewer), strike us as the most important amongst a more detailed list of deductions enumerated by our author. We shall not reiterate our comments on these inferences, but merely state our own conviction, as based upon personal observation, and upon the experience of others. It is this:—Petit's operation may be kept in view as the preferable alternative, when there is no contra-indication; but we believe the ordinary operation to be that which is applicable to a great majority of cases, including all forms of hernia.

We regard Petit's operation as specially applicable to the femoral form of hernia; also to cases in which the rupture is of recent descent, or, if old, when it has been small and easily and entirely reducible. Further, it is specially applicable to cases in which the symptoms of strangulation, though acute, have been but of short duration. We deprecate, with our author, the use of purgatives before operating, and their early use afterwards. We entirely eschew tobacco; have but little faith in the warm bath or bleeding in aiding the taxis; and regard chloroform as a valuable substitute for both; indeed, hernia and dislocation may be included in the same category in making this remark. Lastly, we approve of opium in most cases, and in many, of calomel in addition, in the after treatment of patients who have been subjected to operation.

[The reviewer concludes with the following observations on the mode of applying taxis. The method which he proposes is certainly ingenious; but, though he declares his complete confidence in its success, it will be observed that he does not state positively whether he has seen it tried. It is obvious that experience alone could determine the practicability of the operation.]

A moment's reflection as to the mode in which pressure is applied to a strangulated mass of intestine or omentum, with a view of forcing it through a narrow canal, must at once render obvious to the operator at how great a mechanical disadvantage he is acting: how much better it would be, if he could pull it through from the opposite side. Let the experiment be made with a truncated funnel, filled with intestine, and let the experimenter first try to *push* the gut through, and then reverse the application of the force, by attaching a string around it, and *pulling* it through. Is it impracticable to imitate this latter and far more efficient method, that of traction? We think not. Let the patient's thighs be flexed and rotated inwards; then let an assistant, standing over the patient, raise him or her by both legs, until the whole trunk is fairly lifted from the bed, and the whole weight is thrown upon the shoulders, the pilow having been previously removed from under the head. This posture must be maintained for a short time, and then the buttocks gently lowered and raised again, the surgeon the while keeping his hand on the hernial tumour, and *gently* aiding by taxis the return of the bowel. Such assistance on his part will often not be required, even where the stricture is a tight one, and much pressure will tend to interfere with its success. These remarks, apply especially to small, recent, and, of course, reducible herniæ; and to femoral, rather than to inguinal. If it fail in such, we should at once desist from any more forcible use of the taxis, being satisfied that it would prove unavailing. The rationale of its success appears to be, that the whole mass of the small intestine, within the abdomen, of which that in the sac is but an offset, is thrown upwards towards the diaphragm, and must, unless the resistance of the stricture be too great, draw the incarcerated portion with it. Of its success we have no doubt; and cannot too strongly urge its general adoption, in place of the coarse and cruel handling to which recent herniæ are too generally subjected, to the great present anguish of the patient, and his greatly deteriorated chance of surviving an operation if afterwards called for.—*Brit. and For. Med. Chir. Review, April* 1850, *p.* 482

100.—ON THE IMPACTION OF FOREIGN BODIES IN THE ŒSOPHAGUS.—By J. ADAMS, Esq., Surgeon to the London Hospital.

[A man, while hurriedly partaking of roast goose, felt something stick in his throat. He applied to a surgeon, who employed a probang forcibly, and as he passed it down to the cardiac opening, the foreign body was presumed to be pushed into the stomach. No relief, however, was obtained by this means, nor was any by the subsequent employment of an emetic of sulphate of zinc. The difficulty of swallowing becoming greater and considerable dyspnœa also occuring, the patient was taken to the London Hospital.]

Mr. Adams happened to be in the hospital at the time; and, on hearing the nature of the previous symptoms, had the patient seated on a low chair, with his head thrown back as much as possible and then cautiously passed a whalebone rod (to the end of which a small brass hook was connected) along the back of the pharynx into the œsophagus. The foreign body was immediately detected about two inches below the level of the cricoid cartilage, and was slightly detatched; but, on the second introduction of the instrument, it was completely withdrawn to the back part of the fauces, so that it could be removed from the mouth by the fingers. It was found to be an irregular-shaped portion of the scapula of a goose, measuring nealy one and three-quarter inches in each direction, and lying vertically in the long axis of the œsophagus. Instant relief was of course afforded, and the patient ordered to keep himself quiet at home for a day or two.

Mr. Adams made the following remarks on the treatment of such cases:—]

The importance of these cases is not entirely disproportionate to the alarm or anxiety felt by the patient or his friends, and in no class of cases are the beneficial results of prompt surgical treatment more immediately displayed. In the first place, we should never omit, under the most urgent circumstances to make a few brief enquiries as to the nature of the substance supposed to be impacted; and, should it be a portion of meat, or any other non-irritating and digestible substanse, the best practice would be to push it on forcibly in the stomach by means of a probang, (or any instrument of the like nature we may have at hand.)

I believe that all sharp or pointed bodies are most safely treated by retraction; and no more convenient or appropriate instrument can be contrived for the purpose than that which I employed. It is a solid rod of whalebone, about twenty-two inches long, and three-quarters of an inch in circumference in the centre, gradually tapering, however, to a point at each extremity; at one end is fixed a round piece of sponge, and at the other end a piece of watch-spring three inches in length, which is covered with silk, and connected securely to a flat blunt button-like hook, having a hole in the centre, for the attatchment of some loops of silk, which are often found of great additional assistance in entangling projecting points of any foreign body; but it may so happen that, on account of some peculiar position which it may occupy in the œsophagus, the flat hook may pass by it repeatedly; still, it is impossible that any additional mischief can be effected by the employment of the instrument which has often, I fear, been the case when the ball probang is invariably used; and, should repeated attempts with this instrument prove ineffectual, the surgeon must not be discouraged.

An emetic of speedy operation has been by some employed with success, from the effects of which we may hope either that the foreign body will be completely expelled, or at any rate that it will have become sufficiently displaced for the hook to entangle it on a second attempt being made, and this, I believe, will generally obtain.

Let us briefly consider what are the dangers likely to arise from the forcible propulsion of foreign bodies onwards, if hard and irritating substances. The mucous membrane and muscular fibres of the pharynx or œsophagus may be extensively lacerated, and this accident would be far more liable to occur should any narrow substance be the offending matter; because, as the œsophagus would not be equally distended at the seat of obstruction, the mucous membrane would collapse above it, and would thus very easily become lacerated by the point of the probang.—

These lacerations may heal and no further mischief arise, or acute inflammatory action may supervene, terminating in diffused or circumscribed suppuration in the cellular tissues around, than which you cannot possibly imagine any cases more distressing to the patient, or perplexing to the surgeon. I well remember two cases which have occurred to me at this hospital during the past three years, a description of which may serve to impress the symptoms and treatment more forcibly on your attention. In both cases the impacted body was one of the small hard bones of the plaice, and in both the distress was extreme. The first case was brought to me as an out-patient, and occurred in a woman, who, it was stated, had swallowed one of these bones three days before. She experienced, when I saw her, the greatest difficulty in swallowing, and was tormented during the attempt with suffocative fits of spasm of the laryngeal muscles: the back part of the pharynx and fauces were very much swollen and congested, but there was no external evidence of any suppuration beyond an indistinct fulness on the left side of the neck, accompanied with tenderness on pressure. Leeches and fomentations were subsequently applied, and mercury also was given at the same time that nourishing broths were administered; but, after remaining some days in the hospital, suffering the greatest agony, she died from pure exhaustion. A post-mortem-examination revealed the true cause of her distressing symptoms. A circumscribed post-pharyngeal abscess existed, which had pressed forwards to the back of the larynx and trachea.

The second case to which I alluded occurred about two months subsequently, also in a woman of previously delicate health. She had swallowed the bone only two days before, since which period gradually increasing difficulty of deglutition had supervened; but her symptoms on admission into the hospital were not so urgent as in the former case. No bone could be felt in the course of the tube with the hook. Leeches were applied to the outside of the neck, but no relief was obtained; on the contrary, the symptoms rapidly increased in severity. With the unfortunate result of the last case in my mind, I was induced most carefully to examine the back part of the pharynx, and discovered a considerable fulness in that region., I did not hesitate to plunge into it a sheathed tonsil lancet, and a quantity of most fetid pus was evacuated. I need not say, that the relief was almost instantaneous. Gargles of chloride of lime were subsequently used; and, by the aid of nourishing diet and tonic medicines, she went on very well for a short time. In a few days, however, more unfavourable symptoms became developed, which were found to arise from the orifice of the abscess being closed, and a fresh accumulation of matter having collected behind. This was soon remedied by the introduction of a probe, which gave vent to almost as great a quantity of pus as was first evacuated by puncture.—Nothing subsequently occurred to retard the favorable progress of the case, the orifice being daily kept patent by the introduction of caustic. I may remark, as one characteristic of suppuration occurring in this locality, that the pus confined in the abscesses had a most noisome sickly odour. more like that resulting from suppuration connected with necrosed bone than anything else I have ever experienced. I have successfully removed a common pin from near the cardiac orifice of the stomach by means of this blunt hook. A surgeon to whom I was showing the instrument, and describing its employment in the above cases, immediately procured one for his own private use, and, strange to say, he had only possessed it a week when he was called on suddenly to test its applicability in case of a boy who had attempted to swallow a counterfeit half-crown to avoid detection by the police, but which had become impacted in the œsophagus, and produced imminent danger of suffocation. The hook fulfilled its duty, and the ends of justice were thus aided.

Let me, therefore, in conclusion, strongly advise you against the indiscriminate use of the probang in cases of impacted foreign bodies in the œsophagus. An instance is now fresh in my memory where one of the most distinguished legislators of the day lost his life in consequence of the impaction of a bone in the gullet, and in which case a surgeon had made forcible use of the probang unsuccessfully. When soft substances, as a piece of meat, are lodged in this canal, then the probang is clearly indicated.—*Med. Gazette*, *April* 5, 1850, *p.* 607.

101.—ACCOUNT OF TWO CASES OF CANCRUM ORIS, SUCCESSFULLY TREATED.—By Dr. J. Drew, House-Surgeon to the Manchester Infirmary,

[Dr. Drew relates two cases of this intractable disease successfully treated by the same means, viz., the application of strong nitric acid, and the administration of chlorate of potash, with wine and meat diet. Dr. D. says:]

The first case is that of Anthony McDonnell, aged nine, admitted to the wards of this hospital on the 18th of last October. From the statements of the parents, he had been of robust health from infancy until about eighteen months ago, when he became the subject of some febrile affection, but concerning the nature of which they could not particularly specify.

Six weeks before the date of his admission, he was attacked with acute and continued pain in left cheek, soon accompanied by a small dark discoloration, which had rapidly increased in size, notwithstanding the treatment of one or two medical men, until it had attained its present dimensions; the pinched physiognomy, and the usual attendant symptoms of this disease were now fully developed, and on examination the dark coloured slough was found to occupy the whole of the left side of the face, passing irregularly from a point just below the orbital surface of the superior maxillary bone, inwards and downwards along the side of the nose, implicating half of the upper lip, to about half an inch below the angle of the mouth, and backwards and downwards over the substance of the masseter muscle; the cartilages of the nose were intact; the immediate edges of the still living parts were deeply reddened, and to all appearances there was no tendency to the formation of a definitive line to its progression. McDonnell was at once put on the best meat diet, ordered daily fifteen grains of chlorate of potash in divided doses, and four ounces of sherry wine; to have the edges of the slough touched all round with strong nitric acid, and a linseed poultice repeated three times a day. Without entering into detail, the remainder of the treatment may be thus summarily stated; for four succesive days the acid was freely reapplied, when rapid separation of the slough took place, and subsequently to its complete removal this potent agent was employed at two irregular intervals on a few suspicious points still remaining, so that altogether it was called into use on six different occasion. The fourth day of his admission he was attacked with diarrhœa, but it readily yielded to a compound of opium, catechu, and chalk mixture. On the cessation of this complication, the chlorate was increased to a scruple, and the wine to six ounces daily; under these enlarged doses he continued gradually but steadily to improve in appetite and to acquire strength, and was made an out-patient on the 3rd of December, or forty-sixth day of treatment. Some time before he left the hospital, it was very evident that a large portion of the superior maxilla would exfoliate, for the ulcerating line of separation was being formed, and bone loosened to an equal extent; and on the seventeenth day after going out they had progressed so favourably, that evulsion of the parts was performed by the aid of a strong pair of forceps, two out of the four processes of this bone (the alveolar and malar) coming away entire, with two of the milk teeth still firmly implanted in their sockets; since then the surrounding soft parts have been so busy in throwing out plastic organizable matter, and contracting, that at the time I now write the disfigurement is not nearly so great as might have been expected, nor the breach so extensive that it may not be remedied at some future period.

[The second case was much less severe, the slough, which extended through the cheek, having merely the superficies of a large wafer. The patient was a litle delicate girl of six years old. The report is that,]

Precisely similar treatment was put in practice in this case, too: at first fifteen grains of the chlorate, afterwards increased to twenty grains daily, and four ounces of wine, increased to six ounces, the best meat diet, and local applications of nitric acid; the latter was used on three successive days before the coming away of the slough, and was esteemed necessary only once afterwards. By the aid of these medicaments she rapidly improved in health, great contractions of the sides of the aperture took place, numerous healthy granulations were thrown out, and by subsequently uniting with others from the implicated portion of gum, this gap, though at first large enough to admit the middle fingure, was completely closed, and she went out of the hospital, on the 10th of December, with a slightly sunken and puckered cheek, but in all other respects better than she had ever been before in her life.

On the fourteenth day of her admission I noticed that about three-quarters of an inch in front of, and somewhat above, the original solution of texture, a small, irregularly circular slough, three lines in diameter, had developed itself; and anticipating its tendency, gently tore away the surface, to ascertain the extent; already it had penetrated to a greater depth than the thickness of the cheek, but fortunately, on account of the very oblique direction, without yet implicating any portion of the mucous membrane. Its progress was at once arrested by the strong acid, a clean surface was obtained in two days, kindly granulations were thrown out and it soon healed without ever opening into the cavity of the mouth.

The profession is indebted to Dr. Hunt for the introduction of chlorate of potash as a remedy for cancrum oris; but since he tendered his account of its virtues in 1843, many persons have thought proper to doubt its efficay, and others have not hesitated to deny it altogether; still though it may be quite true that the method of its action upon the organism is doubtful, it is only an accumulation of the evidence of experience that can establish or deny its merits as a medicament. When first made use of it was thought to produce a beneficial influence by the diffusion of some of its contained oxygen; but as soon as it was objected that it might be detected unchanged in the urine of persons taking it, many thought this fact quite sufficient to upset the chemico-physiological theory of its action, without remembering that it had not been shown that the same amount of the salt might be collected from the urine as was administered by the mouth, and consequently not proved that a portion at least might not be acted upon and decomposed. As far, however, as the experience of five cases will enable me to judge, I should not think it advisable to trust to any constitutional treatment alone, any more than in the case of sloughing phagedæna in a different part of the body. It is essential that the portions of tissue which have taken on diseased action should be thoroughly destroyed; whether by the nitric acid other potential agent, or the actual cautery itself, after the fashion recommended by Mr. Obré, appears to be quite immaterial; neither, on the other hand, should I like to trust to local treatment alone, for the gradual death of tissue is merely the consequence of a constitutional disease; and though layer after layer of texture might be destroyed, still the root of the evil would remain untouched. Both methods should be put in practice at the same time; and I am sanguine enough to think that the person who will put his trust in them will find that this disease, by their combination, is as much under the influence of treatment as most other affections to which our bodies are liable.

In applying the nitric acid it is a matter of some importance to instruct the little patient to inspire fully previous to its application, that the lungs may be filled with air, and thus guarded in some degree against the difficulty or even danger that might result from the inhalation of nitrous fumes; and in the course of treatment it will be found of great advantage to separate carefully every slough as soon as formed, using, if necessary, even some little violence for the attainment of this object, on account of thus obviating to a considerable extent the great contamination of the air of inspiration.—*Lancet*, *Feb.* 16, 1850, *p.* 206.

102.—OPERATION FOR CLEFT PALATE.—By SAMUEL SMITH, Esq., Surgeon to the Leeds General Infirmary. (Reported by Mr. T. SCATTERGOOD.)

[The patient in this case was a young man of eighteen years old. The operation and subsequent progress of the case are thus narrated:]

Nov. 22nd, 1 p. m.—Mr. Smith operated. The first step in the operation was to divide the levator palati muscle on each side, as advised by Mr. Fergusson. This was done with great ease, for when the velum was touched, the muscle was thrown into strong action, and could be felt by the finger as a tense cord. The edges of the cleft were then pared, by transfixing each flap near the upper extremity of the cleft, and carrying the knife down to the apex of the uvula so as to separate a narrow strip of mucous membrane on each side; then removing both these portions, hitherto left connected together and to the velum, by dividing their common attachment. The patient was now sent away to wash his mouth out well with cold water, while another operation was being performed, Mr. Smith not wishing to attempt the union of the cut surfaces until the bleeding, which was not great, should have ceased. After a few minutes the patient returned, and all oozing having ceased, two sutures were introduced, one about a quarter of an inch from the apex of the uvula, and the other midway between the first and the upper extremity of the cleft. Small curved needles, threaded with a long silk ligature, were employed, and they were introduced by means of a pair of dressing forceps, having a small flat piece of cork, one-eigth of an inch thick, tied upon the inner roughened surface of each blade. The operator, standing in front, passed the needles from without to within on the left side, and from within to without on the right side. Holding in his left hand a slip of cane about five inches long, armed at its extremity with a small cork,—by gentle pressure with this instrument he prevented dragging of the flaps, while the needles were being introduced, and received upon the cork the point of each needle after it had passed through the soft parts. The sutures were then tied with the ordinary reef-knot, and the patient was sent to bed, with strict injunctions to take nothing to eat or drink until the next morning, and not to speak to any one except the house-surgeon or nurse. During the whole of the operation the patient behaved with great firmness and self-control; but considerable embarrassment was caused by the occurrence of vomiting which took place four times during the operation.

23rd.—The patient had strictly obeyed the directions which had been given him as to abstinence from food and from conversation. He was now allowed (about ten a. m.), to take a little boiled milk with arrow-root, and it was found that none of it passed into the nose. The apex of the right portion of the uvula was observed to be discoloured, as though likely to slough.

25th.—One of the sutures was removed on the 24th, and the other this day. The edges of the cleft were found to be united, as far down as nearly to the second suture; a portion of the apex of the uvula on the right side was sloughing.

Dec. 4th.—The case had proceeded quite favourably; the union of the upper three-fourths of the cleft was now quite firm, and at the lower part of the uvula there were two clean granulating surfaces. A suture was introduced in the same manner as previously, to keep these surfaces in apposition.

9th.—On removing the suture, the parts were found to be quite adherent.

14th.—There was no fissure remaining. The uvula was rather shortened and thickened at its apex, but its movements were quite perfect. Ever since the operation, the patient had been able to swallow liquids without any portion of them regurgitating, as they previously did, through the nose. His speech was somewhat improved, and the improvement was very apparent indeed when he was induced to make the attempt to speak distinctly. It was evident that the muscles required tutoring in order to articulation being rendered completely distinct.

The principal peculiarity in this operation was the employment of a pair of dressing forceps, to the inside of the blades of which (as above described) portions of cork had been fastened, for the purpose of holding the needles. This instrument was found to have a great advantage over the *porte-aiguille*, inasmuch as the latter can only hold the needle in one direction; whereas, by the armed forceps the needle may be securely held at any angle, and pointed in any direction whatever. The cork attached to a handle, which was held in the left hand of the operator, by means of which he was enabled to make, as it were, counter-pressure, and to receive the points of the needles, was also found very useful; the cork held the point of one needle so firmly, that the latter was withdrawn, by its means, fairly out of the mouth.

The firmness of the patient, in steadily abstaining from any but liquid food (boiled milk and arrow-root) for many days after the operation no doubt contributed greatly to its success.—*Medical Times, Jan.* 19 1850, *p*, 37.

URINARY ORGANS.

103.—NEW MODE OF TREATING CERTAIN CASES OF STRICTURE OF THE URETHRA. By Prof. SYME, Edinburgh.

[The following is Mr. Syme's account of the first case in which he performed the operation which he now brings before the profession as being perfectly safe and successful.]

About six years ago, I was requested by the late Dr. Hay to take charge of a gentleman who had suffered long and severely from stricture of the urethra. He was between forty and fifty years of age, of tall stature and robust form. His complaint had existed twenty years, and during the earlier part of this period had been partially alleviated by the introduction of bougies, but had then gradually increased, until at length the suffering occasioned by it was altogether intolerable. During both day and night, the calls to make water were extremely frequent; and excited the most violent expulsive efforts, which, aided by a milking-like manipulation of the penis, and pressure along the perineum, never produced anything more than a scanty dribbling discharge. From the bladder being thus imperfectly emptied, the urine was constantly passing away insensibly, so as to keep the clothes wet, with what discomfort to the patient may be more easily imagined than described. He was peculiarly susceptible in regard to atmosperic changes, and especially in damp weather suffered an aggravation of the symptoms. The urine, when collected on such occasions, was found to deposit large quantities of glairy mucus, from which indeed it was never quite free.

On examination, I found a tight stricture between five and six inches from the orifice of the urethra: and, at the second or third attempt, succeeded in passing the smallest-sized bougie fairly through it into the bladder. I then supposed that, as usual, there would not be any further difficulty in treating the case, and desired the patient to call upon me twice a week, unless when the weather or any other circumstance should render a longer delay necessary. The progress, though not rapid, at length enabled me to pass No. 5 of my scale, equal to No. 1 of that in common use, when I found it impossible to make any advance. Indeed there was little encouragement to persevere in attempting this, as, notwithstanding the degree of dilatation that had been accomplished, there was not any appearance of relief from the symptoms of the disease.

I then proposed to confine the patient to bed, and keep a succession of catheters, gradually increased in size, in the bladder. He made no objection, and was greatly pleased to find that, instead of the irritation he expected, there was at once obtained complete relief from all his previous uneasy feelings. He read and wrote, ate and slept, without the least disturbance, drawing off the urine from time to time, and observing to his great satisfaction that the mucus had entirely disappeared. At the end of ten days I withdrew the full-sized silver catheter then employed, and before twenty-four hours had expired, found the complaint in every respect exactly as it had been before the process was commenced.

Some months after this, I divided the stricture from within by means of a catheter containing a lancet blade, which was protruded from its sheath after the instrument had been passed through the seat of contraction, and kept in this expanded state while the catheter was withdrawn. A large bougie was immediately afterwards passed with perfect ease; and again hopes of success were entertained. But the next day things were in precisely the same state as formerly.

Several months having elapsed without any change, it was resolved to combine the two last mentioned modes of treatment. In the first place, I divided the stricture as before, but on both sides, by means of two lancet-catheters, cutting right and left, and then introduced a full-sized catheter into the bladder, where it was retained for a week. For some time afterwards, it seemed as if benefit had resulted from this procedure, and the patient, by frequently passing a bougie or catheter through the strictured part, was enabled to make water in a tolerably full stream. But this imperfect relief was of short duration, and by the end of two or three weeks, the frequent calls, laborious straining, and copious mucus, proclaimed that the stricture had regained its former condition.

The patient now protesting that life was not desirable under the torment of his complaint, and entreating me to employ some efficient measure of remedy, no matter at what expense of pain or risk of danger, I resolved to divide the stricture by free external incision. With this view, a small staff, grooved on its convex side, having been introduced, I made an incision in the raphè of the perineum from the bulb to the anus, and then feeling for the stricture, which was easily recognized by the surrounding induration, ran the knife fairly through the whole extent of the thickened texture. A full-sized catheter was substituted for the staff, and retained for a few days. The patient suffered little from the operation, except some uneasiness from irritation caused by the urine passing through the wound. When it closed he felt quite well; and he continues to do so, though several years have now elapsed. He has never required the bougie, and in every respect he enjoys the most perfect health.

In this case, the obstinacy of resistance, and tendency to contract, occurred in an extreme degree. Indeed, the latter peculiarity was so strongly marked, that it suggested the idea of an adventitious elastic texture, or rather one possessing contractile properties similar to those of the middle coat of the arteries. It is plain that the most prolonged use of bougies would not have effected a cure. And the result of retaining catheters in the urethra, shows that this mode of treatment is not so effectual as it has been represented, since it only produced a temporary dilutation. But the most important lesson is to be drawn from the results of the different trials that were made of internal incision by lancet-catheters. Additional space was thus at once obtained, and the passing of bougies was greatly facilitated, without any lasting difference being effected in the contractile power of the stricture.

It hence appears that this mode of treatment affords no practical advantage, since, in the ordinary condition of stricture, bougies accomplish recovery on the easiest possible terms; and in its obstinate form, an internal incision does not prove sufficient to relieve the patient. The reason of this I believe to be, that the obstinate stricture in question requires, for its complete and permanent remedy, a thorough division of the firm texture which surrounds the contracted part of the canal.

[The operation is performed in the following manner:—]

If the patient has a great deal of pain, and wishes to escape from the slight degree of it which attends the requisite incision, he should be placed under the influence of chloroform—not partially, so as merely to suspend his consciousness or impede his recollection of suffering—but completely, so as to prevent any restlessness or unruly struggle, which would tend very seriously to increase the difficulty of the procedure. He should then be brought to the edge of his bed, and have his limbs supported by two assistants, one of them standing on each side. A grooved director, slightly curved, and small enough to pass readily through the stricture, is next introduced, and confided to one of the assistants. The surgeon, sitting or kneeling on one knee, now makes an incision in the middle line of the perineum, or penis, wherever the stricture is seated. It should be about an inch or inch and a half in length, and extend through the integuments, together with the subjacent textures exterior to the urethra. The operator then, taking the handle of the director in his left, and the knife, which should be a small straight bistoury, in his right hand, feels, with his forefinger guarding the blade, for the director, and pushes the point into the groove behind, or on the bladder side of the stricture,—runs the knife forwards, so as to divide the whole of the thickened texture at the contracted part of the canal, and withdraws the director. Finally, a No. 7 or 8 silver catheter is introduced into the bladder, and detained by a suitable arrangement of tapes, with a plug to prevent trouble from the discharge of urine.

The process having been thus completed—which it may be in less time than is required for reading its description—the patient has merely to remain quietly in bed for forty-eight hours, when the catheter should be withdrawn and all restraint removed. The urine sometimes retains its proper course from the first, but more frequently passes in part through the wound for some hours, or it may be a few days. No attention or interference is required on this account, but at the end of eight or ten days a moderate sized bougie should be passed, and be repeated once a week or fortnight for two months. In most cases, the cure may then be deemed complete and lasting. But if the tendency to contraction should have been extreme, or if the patient's way of life should be such as to favour the reproduction of stricture, it will be a prudent precaution to have the bougie passed four or five times in the course of a year, in order to avoid all risk of future trouble.—*Brit. and For. Medico-Chirurg. Review*, *April*, 1850, *p.* 324.

[It must be remembered, as the reviewer of Mr. Syme's book in the journal from which our extracts are taken, observes that the operation here proposed differs widely from that in which an incision is made into the perineum, where *no* instrument can be passed into the bladder; but, as will be seen in another part of this article, Mr. Syme boldly asserts that no such case as impermeable stricture exists, and he challenges the London surgeons to send him any case in which they have failed to introduce an instrument, staking his reputation on his own success. This is a bold measure of Mr. Syme's, and we shall watch the result with great interest.

The following is the account of a case in which Mr. FERGUSSON recently performed the operation of division of stricture:]

The patient, a man between 36 and 40, has laboured from his childhood with difficulty in urinating. At the early age of 5 he was under the care of a medical man in consequence of this difficulty, and of his wetting himself when he walked about. About ten years since he had a gonorrhœa, since which the difficulty in making water has increased. About twelve months ago, his symptoms were much aggravated, and he suffered from an attack of retention of urine, and since this period his water has merely dribbled away from him. Catheters have been used from time to time, but none could be introduced into the bladder for a considerable period, although attempts have been made. On his admission to the hospital, Mr. Fergusson attempted to pass instruments, but it was impossible to get anything through the stricture, which was tough and irritable, situated in the bulb of the urethra in front of the triangular ligament; there was no fistulous openings in the perineum, but the urine was loaded with copious mucous deposits, showing a great amount of irritation of the bladder, which called for some decided relief. Mr. Fergusson therefore determined to lay the stricture freely open. Previous to this operation, however, a careful attempt was made with the catheter, whilst the patient was under the influence of chloroform, but it was impossible to get through the stricture; the operation was then proceeded with in the following manner.

The patient being placed in the position for lithotomy, a sound, with a groove in the centre, was carried down to the face of the stricture, and held there by an assistant. An incision was then made in the centre of the perineum, and the knife was carried into the groove of the staff, and run forward until a portion of the stricture was divided. A full-sized silver cathether was now introduced, and an attempt was made to pass it into the bladder, the knife being at the same time used to cut the remainder of the stricture; at this step of the proceeding there was great difficulty, and the silver instrument could not be carried into the bladder; this, therefore, was removed, and Mr. Fergusson carried a No. 8, gum-elastic catheter into the urethra, which, with some manipulation, very readily entered the bladder, and was retained there. There was very little hemorrhage in this case.

Mr. Fergusson stated that in these cases when difficulty was met with, as in the instance before them, it was owing to his not being able to hit the opening of the triangular ligament after having divided the strictured portion in front.

One thing very worthy of notice here was the facility with which he passed the gum-elastic catheter after the silver instrument had been tried in vain. He had experienced the same thing before in these operations. We have particularly noticed this before in the hands of this surgeon; and we, a short time ago, witnessed this circumstance in the hands of another able surgeon who performed the same operation. In this case there was so much resistance to the silver catheter that it was very nearly split in two; yet, on attempting a flexible instrument it went in, although no more of the urethra was divided.—*Med. Gazette, May* 3, 1850, *p.* 775.

[This patient appeared to go on well for some days, but symptoms of great prostration came on, and he died on the thirteenth day from the operation. The cause of death appeared to be mere exhaustion.]

[The following case was under the care of R. Partridge, Esq., Surgeon to the King's College Hospital:]

Since Mr. Syme has so strongly advocated the division, through the perineum, of such strictures as will not yield to the ordinary means of dilatation, the practice has been imitated in various London hospitals, with results not quite so favorable as those referred to in Mr. Syme's book on the subject. Nor does it seem that the knife was resorted to in London when even a very small instrument could pass, and, so far as we are aware, no urethra had been incised, except it was quite impassable, though Mr. Syme advises an operation when the surgeon has to deal with intractable, though not quite impervious strictures.

The cases which we have had an opportunity of reporting ('The Lancet,' Dec. 8, 1849, p. 617, and Feb. 16, 1850, p. 217,) were both successful. We have, however, now to mention one, lately under the care of Mr.

Partridge, where the division of the stricture was not followed by such happy results; but it will be perceived by the sequel, that various circumstances, unconnected with the operation itself, had much influence on the issue of the case.

Case.—The patient, a man, thirty-seven years of age, and of temperate habits, was admitted on the 24th of December, 1849, under the care of Mr. Partridge, with abscess in the perineum, which had appeared three days previously. He stated that he had twice been affected with syphilis, and once with gonorrhœa, followed by swelled testicle. Eight years ago he suffered from stricture, and was successfully treated by bougies, so that he could pass his urine in a full stream. Two months since the stricture reappeared, with retention of urine, when he applied to a medical man, who, by passing a catheter, gave him much pain, but afforded him great relief. When admitted, he presented a deep-seated abscess in the perineum; it was hard and inflamed, and it pressed on the urethra in such a way as to impede the flow of urine through the canal, this fluid being voided guttatim. There was also an œdematus state of the scrotum, which was tender and painful. Pulse weak and slow, and pain complained of on micturition.

Fomentations and morphia at night gave him some relief. Seven days after admission, Mr. Partridge opened the abscess, and evacuated a great amount of pus. This measure gave the patient much comfort, and he was soon able to void a small stream of urine without pain.

On the 6th of February, forty-two days after admission, the symptoms became again so alarming, that Mr. Partridge cut down upon the perineum, just behind the scrotum, and opened two or three irregular sinuses. Ten days after this, Mr. Partridge, having found it impossible to pass an instrument into the bladder, resolved to lay open the urethra, and the patient was brought into the theatre on the 16th of February.

The Operation.—He was placed in the position for lithotomy, and, brought under the influence of chloroform, when Mr. Partridge introduced a small staff down to that point of the urethra which offered complete resistance to the passage of an instrument—viz., the bulb. The first incision ran exactly along the raphé, and was about two inches long. Mr. Partridge then cut very cautiously towards the deeper structures, and after some dissection reached the groove of the staff. When the knife was securely placed in the groove, it was made to divide the spongy portion of the urethra upwards and downwards, including the principal stricture just behind the bulb, to such an extent as was likely to allow an easy passage to a catheter. The latter measure was, however, accomplished with considerable difficulty, owing to the contorted and irregular course of the canal. The obstacles were finally overcome, an elastic catheter was passed into the bladder and retained there by appropriate means.

The patient went on pretty well until about four days after the operation, when the scrotum became œdematous, signs of erysipelas appeared, and he lost his rest and appetite. Great sickness soon came on, the œdema spread to the penis, the pulse became small and thready, the countenance anxious, and low delirium set in. The water passed, however, chiefly through the catheter, and very little through the wound. As the scrotum and penis threatened to slough, Mr. Partridge made several superficial incisions into these organs. This measure gave the patient some relief; but he soon had a considerable loss of integument on the lower part part of the penis, gradually became weaker, and died ten days after the operation.

Mr. Partridge remarked, in a clinical lecture which he gave on the subject, that abscesses such as those which were opened in this case, do not always communicate with the urethra, but that they may cause stricture by mere pressure on the canal. Such abscesses have been known to form, during gonorrhœa, along the urethra or by the side of the rectum. In this case, however, the patient suffered from a chronic-abscess in the perineum; this peculiar kind is seldom found along the urethra. Thus, the incision which was made did not relieve the stricture, although a very little urine escaped through the former. This patient had had a similar perineal abscess several years before. In his present attack the urine continued to flow by the natural outlet of the size of No. 3 catheter; and when this is the case we are not justified in laying open the urethra, provided there be no complications.

But in this case the stricture was complicated with fistulous tracks, and it was deemed prudent to lay these open, especially as the parts around were much thickened, and almost cartilaginous. Mr. Syme is even an advocate for laying open the urethra in simple stricture, by an incision in the median line, where no such tracks exist as a complication, and without any abnormal induration of the tissues; Mr. Syme's is an old operation revived.

In this case, as the catheter could still not be passed beyond the obstruction any better than before the incision was made, it was determined to lay open the seat of the stricture by a second operation. But in many long-standing cases, the urethra becomes impervious anterior to thes tricture, and then we must lay open the whole canal, and allow a passage to form over a catheter retained in the track. Stricture of the urethra may occur at any part, even at the orifice, or through its entire extent, but the most usual seat is where the membranous portion joins the bulb. Spasmodic stricture results from the action of those fibres of the accelerator urinæ which encircle the urethra in front of the membranous portion. The whole muscle, indeed, may act spasmodically in this way, and compress the commencement of the spongy portion. The encircling fibres alluded to are not always present in every subject.

On a post-mortem examination being made, the posterior lining mucous membrane of the bladder was found congested and studded over with earthy deposits of salts of lime. There were also three or four bands in the prostatic portion of the urethra, and numerous false passages of old date. The stricture was very long and the urethra anterior to it much contracted in calibre. Unfortunately this patient caught the infection of erysipelas, which commenced at the scrotum, and led to acute œdema, resembling in appearance the effects of infiltration of urine. Owing to this œdema, the cellular tissue both of the penis and scrotum, partially sloughed, and several superficial incisions were made to relieve the tension of the parts. Being a nervous, irritable man, he sank from the erysipelas, which did not, however, extend beyond the pubes and the lower part of the abdomen. As regards the original malady, it was a case well suited for Syme's operation, as the tissues were much indurated, and the stricture, of great extent, rendered the urethra tortuous as well as constricted.—*Lancet, April* 13, 1850, p. 452.

[In reply to the remark made at the commencement of the above case of Mr. Partridge, respecting the unfavorable results which have followed the operation for division of stricture in the London Hospitals, Mr. Syme observes:]

Now, such results were to be no less surprising than distressing, since, from all that had fallen within my own observation, the operation, in so far as it concerned the patient's life, seemed to be absolutely free from any danger whatever, and they constrained me to suppose that some error must have been committed in the mode of performance, as, through an imperfect division of the stricture, which would expose to the risk of urinary extravasation, or through opening the urethra at its side instead of the middle line, which would endanger the artery of the bulb. But from all these unpleasant speculations I was at once relieved by the further statement of your reporter, that in no case "was the knife resorted to in London when even a very small instrument could pass, and, so far as we are aware, *no urethra has been incised except it was quite impassable;*" since it thus appears that the fatal cases which have been placed to the credit of my operation and adduced at the meetings of your medical societies in London as evidence of its danger, were performed in accordance, not with the principle advocated by me, but with that of the old, or as, for the sake of distinction, it may be called the "London" operation, in regard to which I have thus expressed my opinion:—"The last, and certainly most objectionable of all the methods which have been mentioned above as in use for the treatment of stricture, is cutting into the perineum in search of the obstructed canal, without any further guide than the point of a catheter, introduced, not through, but merely down to, the accustomed part." Sir B. Brodie says very truly,—"Even under the most favorable circumstances, it cannot be otherwise than doubtful whether the stricture be properly divided—that is, whether the incision has passed through the narrow canal in the centre, or through the solid substance on each side, I suppose that no surgeon would recommend such an operation, except as a last resort, when no instrument could be made to pass through the stricture by other means." It might be added, that, in addition to the danger thus incurred, of establishing an imperfect canal, constantly disposed to contract, and inconvenient from its tortuous direction, there is also the immediate hazard of failure in accomplishing the introduction of a catheter into the bladder, which would expose the patient to nearly certain death from extravasation of urine.

No two operations can be more different in the principles upon which they are founded—the security of their execution—and the result of their performance, than the one thus so justly reprobated, and that which, it has been my endeavor to recommend. The ground of the former is belief in the impermeability of the stricture, while the latter essentially requires the passage of an instrument through it. The former is protracted, uncertain, dangerous, and unsatisfactory: while the latter is done at once, perfectly safe, and completely effectual. It must have been from confounding two procedures so entirely different, or more probably from acquaintance with only one of them, that an hospital surgeon in London, when consulted as to the expediency of submitting to my treatment, coupled his sanction with advice, that the patient should, in the first place, make his will.

The operation by external incision hitherto employed has been resorted to as the refuge of awkwardness, or failure in the introduction of instruments, there being no truly impermeable stricture, while the one now advocated can be accomplished only by steps requiring the nicest manipulation. Passing rigid instruments through a tight stricture was said, by Mr. Liston, to be the "most difficult in the whole range of surgical operations;" cutting into the groove even of a large staff is considered by many the most embarrassing part of lithotomy; and conveying a catheter into the bladder through a urethra having a slit in its side, would perplex an eperator not well acquainted with the course of the canal. Such being the nature of the operation, it should hardly be undertaken by any one who is not able to overcome the ordinary difficulties which are presented in the surgical treatment of the urethra.—*Lancet, April* 20, 1850, *p.* 487.

[In a paper read by HENRY SMITH, Esq., before the Westminster Medical Society, he said that,]

The operation of dividing the urethra from the perineum was only generally considered necessary when no instrument could be passed through the stricture; but latterly it has been recommended by Professor Syme, of Edinburgh, that a free division of a stricture should be made, even in instances where an instrument could be passed. If the operation of cutting into the urethra were free from danger, this would doubtless be the readiest and most effectual method of treating those obstinate forms of stricture which Professor Syme had alluded to; but when they came to recollect that such an operation was likely to be attended with fatal results, they must pause before they follow such a doctrine. He (Mr. Smith) thought that the surgeon was not justified in cutting so freely into the urethral canal in such cases, and, he thought, should look for some milder means than the use of the knife. He was fully borne out in this opinion by the result of a case where the operation had been done, and a fatal termination had taken place. He would mention the case: it was that of a fine young man who had suffered for several years from a stricture of the urethra, which was very obstinate and irritable, resisting the ordinary methods. The patient happened to be under the care of his surgeon, a very skilful man, soon after Professor Syme's work came out. The operation of dividing the stricture was resorted to, a small grooved staff being first passed through the stricture. The operation was well done; the patient had some bleeding the night after. He went on pretty well for some days, when bad symptoms set in, which rapidly took a low form, and he sunk within a fortnight after the operation, with all the signs of irritative fever. On post-mortem examination, no extravasation of urine, nor any inflammation within the pelvis, was found, and the bladder was perfectly healthy. This case spoke forcibly against division of a stricture, except when it was absolutely necessary, and he deemed it was only so when no instrument could be passed. The question, then, was, what means had the surgeon at his disposal to remedy those cases of stricture which Professor Syme had described as being so undilatable and so obstinate that they cannot be cured by the catheter alone. He considered they had a valuable remedy in the potassa fusa, which, although a troublesome and perhaps dangerous agent if carelessly used, when employed with proper precaution, was of much service, and, in his firm conviction, would often lay aside the necessity of the the knife. Caustic had been much abused by some surgeons, and therefore it had fallen into discredit; but this was no argument against the remedy. He was surprised to see that Professor Syme, in his work on "Stricture," had denied the benefit of caustic, and had stated his belief that it could not remove an organic stricture. But without referring to the numerous cases which had been treated by a fellow of the Society, (Mr. Wade,) and which had been published by him, he (Mr. Smith) could convict Professor Syme of an error, by relating the following case:—A gentleman, aged forty, applied to him in the end of November last. He was one of the last patients of the late lamented Mr. Morton, under whose care he had been for some months. He had suffered many years from stricture Mr. Morton had passed an instrument once into the bladder, but of late had not been able to get anything through the stricture; and when Mr. Smith saw him he was suffering much; he had had some attacks of retention of urine, and his water occasionally came away only in drops, and he was in great mental distress. He had very cautiously several times attempted to introduce a catheter. but nothing would go in; and he told the patient that he must either be cut, or must have caustic applied. The latter plan was agreed upon. The potassa fusa was applied by means of a wax bougie. The stricture, which was long and tough, gradually gave way; and on the seventh application he passed a No. 6 catheter into the bladder, and he can now pass with ease the largest instrument in his case. This case showed the efficacy of caustic, but he would not resort to it unless it were actually necessary; yet he thought that it should be applied to those cases of stricture which would not dilate by the bougie, and where Professor Syme recommended cutting. He felt it was the duty of the surgeon to use it, and he believed that the knife might be to a great extent dispensed with if the potassa fusa were carefully employed.—*Lancet*, *Feb.* 23, 1850, *p.* 248.

[Mr. SYME, however, boldly advances the opinion that there is no such thing as an *inpermeable stricture.* Were not the authority so eminent, we should be led to doubt such a fact. The following observations have been elicited from him by certain remarks made by some of the London surgeons on his paper on stricture, and on his mode of curing it. He says:]

This operation is founded on the fact, as I believe it to be, that there is no stricture of the urethra which can resist the introduction of instruments sufficiently small, and guided with sufficient care. I have distinctly stated this persuasion, and am prepared to maintain it without any qualification whatever.

Any stricture which resists the attempt of a surgeon to pass an instrument through it, though impermeable as far as he is concerned, may not necessarily be so in the hands of others. During my incumbency at University College Hospital, there was admitted under my care a stricture of the urethra which had proved impermeable to the diversified efforts of many gentlemen in the naval service for nine years, and finally led to the patient's dismissal as incurable. But at the very first attempt in this case I passed a bougie into the bladder, and in the course of a few weeks removed all trace of the contraction. Five months ago, a gentleman from Ireland came over in quest of relief for a stricture, on account of which, two years before, he had been six weeks under the care of Mr. Liston, who, notwithstanding many attempts, did not succeed in passing any instrument; and although the symptoms denoted a great aggravation of the disease during the time which had subsequently elapsed, I passed a grooved director, divided the stricture, and was happy to learn, from a letter received to-day, that the patient "is as well as ever he was in his life." In the Royal Infirmary of this city, there is at present under my care a young man who, six years ago, was dismissed from the army of the East India Company, after five years' service, as incurable, on account of stricture. He had been under the care of various practitioners without obtaining relief, and for the last sixteen months had once a week passed a steel bougie, fairly into the bladder, as he thought.

Finding the symptoms indicative of something more than mere obstruction, and suspecting that there was a false passage through the prostrate, I carefully examined the canal, and succeeded in passing a small instrument into the real cavity of the bladder, where a stone was detected. Chloroform having been administered, I performed the requisite operation upon the small director, which had been introduced, and extracted a stone weighing *three ounces and a half*. The patient had no unpleasant symptom, and has now the prospect of being quite well in a few days. In many more cases which I could mention, the stricture was deemed impermeable without truly being so; and perhaps those lately reported in 'The Lancet' as thus regarded might have proved no less amenable to treatment. I firmly believe that they would, and therefore feel most anxious to impress the conviction that the alleged impermeability has no real existence.

Since the public profession of this belief, founded upon more than twenty years' hospital practice in the largest medical school of Her Majesty's dominions, seems to have had no effect in awakening the attention of London surgery, further than to elicit some incredulous sneers and flat denials, I beg to express my readiness to receive into the Royal Infirmary of Edinburgh any patients who may bring with them certificates, from a London hospital, of laboring under *impermeable* stricture. I shall be happy to pay their expenses in coming and returning by the steamboats, which sail twice a week, and would afford the most comfortable conveyance for invalids frequently disturbed with calls to make water. They will be treated under the observation of students from all parts of the country, and the result of their cases shall be published. If any more satisfactory mode of establishing the truth can be suggested, I shall be happy to adopt it.—*Lancet, May* 18, 1850, *p.* 605.

104.—ON THE TREATMENT OF STRICTURE OF THE URETHRA BY CAUSTIC.—By Robert Wade, Esq., Senior Surgeon to the Westminster General Dispensary.

The potassa fusa appears to me to act beneficially upon strictures:—Firstly, by its dissolvent powers: Secondly, by promoting absorption, and stimulating the congested vessels to contraction; Thirdly, by relieving irritability and inflammation.

Method of applying the potassa fusa.—Before using the potash, a bougie should be passed down to the stricture, that its distance from the orifice of the urethra may be correctly ascertained. A small piece of pottassa fusa should be inserted into a hole made in the point of a soft bougie. The eighth part of a grain is the smallest, and a grain the largest quantity of the potash I am in the habit of using; but it will rarely be necessary to exceed the sixth of a grain. It will be well to make two notches in the bougie containing the potash; one, marking the exact distance of the stricture; the other; an inch beyond; as, very probably, on introducing the armed bougie, the first mark may be concealed within the urethra, from the penis being more stretched than when the measurement was taken. The bougie must be well moulded round the potassa fusa, so as to prevent the alkali from projecting; and it should be so placed that it may be more applied to the upper than the lower part of the stricture, for obvious reasons. Armed bougies should be well rounded at their points, to guard the urethra from the action of the potash before it reaches the stricture. In very bad cases it may be advisable occasionally to use the potassa fusa in the recumbent position, as it will then not only be best applied to the surface of the stricture, but be most likely to penetrate its texture, which, in old and hard obstructions, is very desirable. The bougie should, of course, be well oiled previous to its introduction.

To impervious strictures, from three to four are the sizes of the bougies I generally employ when using the potassa fusa; and, to such as are pervious, they should be used of a size or two larger than the obstruction, which the point of the instrument should penetrate. The armed bougie must be rapidly passed down to the stricture, and held against it, with gentle but steadily continued pressure, for one, two, or three minutes, according to the nature of the obstruction, which if very irritable and readily bleeding, the shortest time, or even less, should be at first selected as the most prudent course.

The periods at which it will be most advisable to repeat the application of the potassa fusa must depend upon its effects and the nature of the cases in which it is used. In many old chronic strictures, I have used the potash advantageously every second or third day; but in others attended with more irritability, it will be better to allow four days to intervene before its application be repeated. There is, however, one safe rule for our guidance upon this point, which is, never to reapply the potassa fusa until the complete cessation of all irritation produced by its previous application. The potassa fusa should be kept in a phial with a ground-glass stopper. If good, it is extremely hard, and of a blue or dirty white color. It should not be broken until required for immediate use.

Cases in which the potassa fusa may be used with advantage.—Firstly, hard, fibro-cartilaginous strictures, impervious to instruments without the employment of injurious pressure; Secondly, hard strictures of long standing, which, although admitting the passage of a small bougie, bleed freely on its introduction; Thirdly, irritable strictures; Fourthly, spasmodic strictures, not arising from acute inflammation of the urethra; Fifthly, strictures which have a marked disposition to contraction.—*Brit. and For. Medico-Chirurg. Review, April*, 1850, *p.* 328.

105.—CASE OF LITHOTOMY IN WHICH A MODIFICATION OF THE BILATERIAL OPERATION WAS PRACTISED.—By Wm. Fergusson, Esq.

[In this case the child was two years and a half old. The operation is thus described:]

Chloroform was administered in the ward, and the boy brought into the theatre in a perfect state of anæsthesia—a mode of proceeding much to be commended, as time and a sudden shock to the child in being brought into a crowded theatre are thereby saved. The patient being held in the usual position by assistants, Mr. Fergusson requested the pupils to maintain a deep silence, in order that the percussion of the stone, which was very small, might be distinctly heard.

After this preliminary step, a staff of an appropriate size was introduced, and the instrument being held in the usual vertical direction by an assistant, Mr. Fergusson made a longitudinal incision along the raphé to within three-quarters of an inch of the anus, and from the lowermost point of this cut, another was made obiquely, outward and downward, towards the patient's left ischium, and and a similar third one towards the right ischium, thus, ⅄. The transverse muscle, levator ani, and deep fascia were then cautiously divided with a straight, narrow-bladed knife, until the membranous portion of the urethra was reached. A double-edged beaked knife was now fixed in the groove of the staff, cautiously pushed forwards, made to divide both lobes of the prostrate gland, and lay open the neck of the bladder. Mr. Fergusson then used a probe-pointed bistoury, with which he notched both sides of the gland, and the forceps having been gently introduced, guided by the index-finger of the left hand, a calculus of the size of a small hazel-nut, very smooth, greyish, and afterwards found to be of the lithic-acid kind, was readily extracted. The child lost very little blood, and Mr. Fergusson proceeded so cautiously, that the operation seemed to extend over a longer space of time than is usually the case. The reasons for this Mr. Fergusson now gave in a few observations which he made after the child was removed. It was at one time generally stated that lithotomy is an easy operation with children, and he (Mr. Fergusson) had himself been under that impression in his earlier days; but he had now found that these operations required a very great amount of care and caution. If much force is used, there is great risk of pushing both the prostrate gland and bladder into the pelvis, and that viscus in such a case is not reached at all. In this instance he had been very careful not to fall into such a mistake, and had therefore proceeded very cautiously, using hardly any force, and carefully recognizing the parts with his finger. A dashing mode of operating is misplaced in such cases, and accidents of a very melancholy nature might be the result of it. It has happened that the surgeon imagined he had cut into the bladder when he was really in front of the neck of that organ, instead of having reached the cavity of the bladder; he had, in fact, pushed the parts before him. When the stone is so very small, there is so very little resistance, that the surgeon finds difficulty in making his incisions; with a large stone there is less hesitation. He (Mr. Fergusson) would advise his hearers always to proceed cautiously, and not to be afraid of taking ten or fifteen minutes for the operation; the more so, as chloroform will effectually keep off any feeling of pain. When the finger reaches to the depth of one inch, or three quarters only, there is a fair presumption that it is within the bladder, but if it goes to a greater distance within, it should be suspected that the parts have been pushed before the finger. The child has progressed very well; in eleven days the urine almost ceased to pass through the wound, and, in seventeen days after the operation, the child was discharged cured.—*Lancet, March* 30, 1850, *p.* 392.

10[illegible].—ON HYDROCELE AND SPERMATOCELE.—By Prof. SYME, Edinburgh.

[In a clinical lecture upon a case of hydrocele which had been operated upon,]

Mr. Syme stated, that he had long ceased to employ port-wine for injection into the tunica vaginalis, on account of its effect proving very uncertain; and that having subsequently used a mixture of the tincture of iodine with three parts of water for this purpose, he had, during the last five years, always injected the tincture alone, and without a single case of failure or unpleasant effect, either in public or private practice. The quantity required was about a teaspoonful, or as much as filled a common sixpenny pewter syringe, which was the most convenient instrument for the operation, as the substance composing it allowed the nozzle to be readily adapted to the canula of the trocar. The fluid when injected was allowed to remain, and while producing the effect desired with absolute certainty, seemed to occasion less pain than any other agent in past or present use.

When the tumour was punctured, the fluid which issued through the tube, to the amount of a pint or more, appeared somewhat turbid, and this was attributed to its probably containing the scales of cholesterine, which are frequently met with in albuminous fluid long pent-up in close cavities. The tincture of iodine, therefore, was injected as usual. But when a little of the fluid was poured from the bason, in which it had been received, into a glass vessel, in order that the gentlemen present might more readily examine it, the absence of scales, and the peculiar opalescence observed, at once suggested the idea of spermatocele, and an appeal to the microscope confirmed this suspicion, by bringing myriads of spermatozoa into view.

Had the true nature of the case being ascertained in the first instance, injection would not have appeared expedient, since spermatocele has not only resisted the means of treatment which have proved sufficient for the remedy of hydrocele, but has also shown a disposition to resent with violence even liberties of a much slighter kind. In illustration of this, there was mentioned a case in which the loss of a valuable life had been nearly sustained from puncture alone without injection. The patient, a distinguished military officer, had twice had the fluid simply drawn off, in London, by Mr. Liston; on the first occasion with so little inconvenience, that, upon the second, he ventured to proceed immediately by railway to Scotland, where he became very ill, and was attended by Mr. Syme for inflammation of the parts concerned, with sloughing of the scrotum, from which his recovery, though ultimately completed, was long doubtful. It was, indeed, the obstinacy of the disease, when subjected to the treatment of hydrocele, which had led Mr. Liston to microscopical research for an explanation of the reason that "cysts which have contained fluids of this kind do not undergo the same process when inflammation is excited in them as serous cysts do; or, in other words, that a cure of such hydrocele, by injection, is not to be looked for;" and the established practice seemed to be limited within the use of palliative measures.

The result of this case was, therefore, watched with interest; and when, after passing through the usual course of a simple hydrocele, under the same circumstances, the swelling quickly subsided, with complete restoration of the testicle to its healthy state, it naturally suggested another trial of the same kind. For this an occasion happened at the time to present itself, in the case of a gentleman, who had had a hydrocele tapped about twenty years ago, by Sir Astley Cooper, and afterwards injected with port-wine by another surgeon in London, but still suffered from it. The tumour was in every respect very similar to that just mentioned; and when punctured, was found to contain the same sort of turbid opalescent fluid. The suspicion of spermatocele was confirmed by the microscope, which detected abundance of spermatozoa: but everything went on satisfactorily after the iodine was injected, so that before the end of three weeks the testicle had very nearly regained its proper size and consistence.

The two cases just related afford encouragement to attempt the radical cure of spermatocele by the injection of tincture of iodine, although other means have been found to fail; and in further testimony as to the efficacy of this agent in the remedy of hydrocele, the following case, related by the gentleman who was the subject of it—treated at his desire in the hospital—

may be added. He is about twenty-five years of age, and was admitted on the 18th of November.

"When a boy, about ten years of age, I got one of my testicles bruised on horseback, which caused hydrocele. Before I thought of consulting a surgeon nearly ten years had elapsed, by which time it had attained the size of a goose's egg. I applied first to the late Dr. Hannay of Glasgow, who punctured it with the intention of injecting port-wine, but finding the testicle somewhat enlarged, he desisted, saying, that to employ the radical cure in my case would be attended with danger. The following day the hydrocele was as large as ever, upon seeing which, he ordered me to keep my bed for a fortnight, hoping that there might be a spontaneous cure; but in this we were disappointed.

"In the spring of 1847 I was in Berlin, where, hearing of the many cures performed by Dr. Dieffenbach, I consulted him. In curing hydrocele he almost invariably performed the operation of incision, which he applied in my case. He performed the *operation* merely, the stuffing of the wound in the tunica vaginalis and bandaging being done by an assistant. In eight days there was a high degree of inflammation, attended by suppuration, and large quantities of matter were discharged; the stuffing, which was slackened by the suppuration, was now daily extracted, the wound was cleared of it in about a fortnight after the operation, and the swelling by this time was considerably reduced. There was fresh stuffing put into the wound daily, which was continued until it had nearly closed; this took place about five weeks after the operation.

"It may not be out of place to state, that there was much attendant suffering, tension of the bladder, gastric fever, and last of all, an abscess formed upon the groin, which had to be opened. I was thus kept almost bedfast for two months. Dieffenbach at last examined me, about nine weeks after the operation, with the result of which he seemed satisfied, and prescribed a lotion for a hardness which existed. At this time the swelling was still about the size of a hen's egg.

"Upwards of a year after, I had an opportunity of speaking to Dr. Angelstein, who was appointed to Dieffenbach's situation in the hospital (pro tempore). He was the first to convince me that I was not cured, and was most anxious that I should allow him to try the injection of port-wine; but as I had heard Dieffenbach declaiming against this 'English method,' I determined not to submit.

"I next came in contact with Dr. Bühring, and mentioned to him the circumstance of his uncle's operation having proved ineffectual. He now made an attempt to cure me by means of electricity. He first stuck two rows of needles on the surface of the scrotum, opposite the testicle, about an inch apart, then, after tapping, he introduced a lancet and scarified the tunica vaginalis; the electro-magnetic apparatus was now set in motion, and the fluid kept streaming along the needles for some time, which caused a burning pain within. In two days there was apparently a sufficient degree of inflammation excited, and every reason to think that there would be a permanent cure; but I was again doomed to disappointment. Dr. Bühring now advised me to submit to the operation of excision, to which I would probably have consented, had I not about this time received a letted from a young surgeon, who had just finished his studies at Edinburgh; he urged me strongly to delay any further operation, relating the success which attended Prof. Syme's operations, and advising me on my return to Scotland to put myself into his hands. I did so, and have now the greatest pleasure in stating that, by an almost painless operation, and after three weeks' partial confinement, I am completely cured.—*Monthly Journal, Jan.* 1850, *p.* 63.

107.—CASE OF HYDROCELE IN WHICH THE IODINE INJECTION FAILED IN EFFECTING A RADICAL CURE. By Dr. R. L. MACDONNELL, Physician to the Montreal General Hospital.

[In this case the dydrocele was very large, and presented this peculiarity that the testicle was situated at the very lowest point of the tumour. Forty ounces of fluid were drawn off, and an injection composed of two parts of tincture of iodine and three of water, was introduced; but this not being followed by obliteration of the sac, at the end of three weeks the fluid was again drawn off, and the following method adopted, as recommended by Mr. Adams of the London hospital.]

A camel-hair brush, dipped in undiluted tincture of iodine, was passed through the canula, and freely applied to all parts of the serous membrane within its reach. The next day, the tunica vaginalis was partially filled with a solid mass of lymph about the size of a large orange. This gradually became absorbed, and in less than three weeks he was discharged perfectly cured.

He again consulted me in June, 1848, for benign polypi of both anterior nares, which had displaced the bones and cartilages of the nose, and had given rise to great deformity and difficulty of breathing. I took advantage of the opportunity to examine the seat of the hydrocele, and found the parts in precisely the same state as when he left the hospital. And again to-day, Feb. 22d, 1849, I examined the parts, and they are found in a perfectly healthy condition.

The foregoing case is not devoid of interest to the practical surgeon, on the following grounds:—

1. The situation of the testicle is quite unusual. Authors have varied in their statements as to the position which this gland occupies in hydrocele; according to some, it is more frequently met at the posterior part, a little above the centre of the tumour; others again assert that it is usually found below the centre; and some have stated that we find it occasionally in front of the tumour; but, as far as I am aware, no one has described its occasional appearance *at the very lowest part of the tumour*; on the contrary, the best practical writers agree in considering this situation of the testicle as a most valuable diagnostic sign between hydrocele and hernia; and it is not unlikely that a careless or superficial examination of the above case would have led to this error; its history, and the appearance of the tumour, being more calculated to mislead the surgeon than elucidate the nature of the disease.

2. The failure of the tincture of iodine injection is extremely unusual. In a note to 'Chelius' Surgery,' by South, it is stated that out of "eleven hundred and forty-eight cases treated by iodine injection, only three cases failed." In instances like the above I would strongly recommend the iodine to be used in the same manner as employed by me; for it does not give more pain than the injection, and it is not so likely to excite excessive inflammation as the introduction of a quantity of pure tincture of iodine, a method of treatment advocated by some surgeons, and it is ceartainly a much less painful plan than that recommended by Prof. Porter, whose operations I have had opportunities of witnessing.

3. A short time ago, the late Mr. Liston showed that the fluid of hydrocele frequently contained spermatozoa, and he drew from this circumstance the conclusion, that in such cases a radical cure, by obliteration of the sac is not to be expected; for, instead of the latter being composed of the tunica vaginalis (a serous membrane,) it is formed of the mucous lining of one of the seminal ducts,—a dilatation of which has taken place, in a manner similar to that observed in the formation of the tumour of ranula. When this discovery was first announced, a good deal of importance was attached to it by the illustrious author himself, and by writers on systematic surgery; yet in the case under consideration a most complete refutation of these views was furnished; for though the fluid contained an immense

quantity of spermatozoa, as proved by careful microscopic examination, the cure was accomplished by adhesive inflammation of the walls of the sac; the result of treatment was also strongly opposed to an opinion recently advocated, viz., that it is not by the effusion of lymph, and adhesion of the walls of the sac, that the cure of hydrocele is affected, but by a restoration of the functions of the absorbents of the part. That a cure is frequently accomplished without obliteration of the sac, is no doubt true; but, on the other hand, it is equally certain that it is by adhesion that the radical cure takes place in a great number of cases, for we know that it is by producing this condition that the success of various plans of treatment of hydrocele is established.

[After referring to observations on the presence of spermatozoa in the fluid of hydrocele, and hypothesis to account for such facts, by Messrs. Liston, Paget, Lloyd, and Dalrymple, Dr. Macdonnell says,]

It seems to me to be more consistent with the facts of the different cases that have been placed on record, and with the particulars of that just detailed, to suppose that in the first instance the disease is merely a simple dilatation of one of the ducts the result of contraction or obliteration of its canals from local inflammation, caused by some injury to the part; that after some time this dilatation gives way, and pours its contents into the cavity of the tunica vaginalis—in which they accumulate in some instances without interfering with the functions of the membrane; but in other instances the serous membrane takes on diseased action, and its secretion becomes mixed with that originally poured out from, and still secreted by, the ruptured cyst. In this way we can understand how the fluid may, in one case, present a limpid appearance, devoid of albumen, and in the other exhibit a copious admixture of albumen, and a variety of colors; and in both, we may find, on microscopic examination, a quantity more or less abundant, of spermatozoa, in some cases alive, in others, dead and partially disorganized.

The practical deduction to be drawn from the above case, however, is, that the detection of spermatozoa should not deter us from attempting the radical cure, which, if we should not accomplish by one method, we may succeed in effecting by another.—*Medical Gazette, Dec.* 21, 1849, *p.* 1049.

108.—ON THE TREATMENT OF CERTAIN CASES OF HYDROCELE BY SETON.—By John Erichsen, Esq., Assistant Surgeon to University College Hospital.

[There are certain cases of hydrocele, Mr. Erichson observes, in which the iodine injection fails to effect a cure. This failure is attributable to two causes; either a sufficient amount of inflammation is not set up, to restore the balance between the absorbing and secreting powers of the tunica vaginalis: or, a good deal of inflammation is excited, but the fluid effused into the tunica vaginalis in consequence of this inflammation, does not become absorbed, or only to a small extent, and the sac still remains distended. Mr. Erichsen says,]

The proportion of cases in which the iodine injection fails to bring about a radical cure of the hydrocele, is variously estimated by different surgeons. Thus Mr. Martin states that in India the failures amount to scarcely one per cent. Velpeau calculates them at three per cent. I am not aware that any stitistics of this mode of treatment in this country have been collected; but the general opinion of surgeons would appear to be decidedly in its favor, as being the most successful as well as the safest plan of treatment that has yet been introduced. In this opinion I fully coincide; but yet I think it by no means improbable that the success of the iodine injection in this country might not prove to be quite so great as is generally believed.

I have during the last few years seen a considerable number of cases of hydrocele of the tunica vaginalis, both in hospital and in private practice, in which a radical cure had not been effected, although the iodine injection had been had recourse to by some of the most careful and skilful surgeons of the day; and several cases which I shall presently relate, have occurred in my own practice.

It is always a source of much annoyance to the surgeon to fail in effecting a radical cure of a hydrocele. The disease occasions much inconvenience to the patient, who has been assured that injection will lead to a radical cure, and who may consequently attribute to want of skill or of care on the part of his attendant, a result that may rather be due to some individual peculiarity. In cases of this description I have found that the patient is seldom disposed to submit to a repetition of this or of any other kind of injection, and the plan that I have consequently adopted, and have generally found to succeed perfectly well, has been the old method of treatment by means of the seton.

There can be no doubt that, as a first remedy, the iodine injection is preferable to the seton in the treatment of hydrocele; but when the injection has failed, and this from no want of care on the part of the surgeon, or of attention to the after-treatment of the case, but apparently from insufficient inflammatory action having being set up in the tunica vaginalis to restore the lost balance between secretion and absorption in this membrane, the seton will, I think, be found to be the most certain means of accomplishing our object. It is true that several objections may be urged to the use of the seton; it requires much watching and care, and is occasionally apt to excite a dangerous amount of inflammation in the cellular tissue of the scrotum; and these objections are to my mind sufficiently valid to prevent our employing it as the ordinary treatment for the radical cure of hydrocele. But it must be remembered, that the particular cases to which I am now alluding are those in which ordinary means have proved insufficient to excite proper action, and in which, consequently, it would appear as if a greater amount of irritation could safely be borne. Indeed, nothing is more remarkable than the difference in the intensity of the inflammation that is set up in different individuals, by the means that are commonly employed in the treatment of hydrocele. In some cases the most irritating injections may be thrown into the tunica vaginalis; or a seton may be drawn through the scrotum, and left there for days, not only without giving rise to any injurious inflammation, but without setting up sufficient action to bring about a cure of the disease; whilst, in other instances, simple tapping may effect a radical cure, or may give rise to such an amount of irritation as to terminate in fatal sloughing of the scrotum. An instance of each of these effects of simple tapping without injection has occurred to me. About two years ago, a gentleman from Cuba consulted me for a small hydrocle, which had been forming for five or six months; I tapped it with a fine trocar, and drew off about five ounces of fluid: a radical cure resulted. This case bears out a remark made by Sir Benjamin Brodie, that the few instances in which he had known simple tapping produce a radical cure, occurred in West Indians. Last winter, I tapped an old man for a large encysted hydrocle, which contained about three quarters of a pint of fluid; inflammatory œdema of the scrotum came on, which proved fatal in about ten days.

The seton that I employ is composed of one or two threads of dentist's silk. It may be introduced by means of a nævus needle, the fluid of the hydrocele being allowed to drain away through the punctures thus made; or, as recommended by Mr. Green, to tap the hydrocele, and then passing a needle, about six inches long, armed with the seton, up the canula, to draw it through the upper part of the scrotum, and then removing the canula, and cutting off the needle, to knot the thread loosely. The thread should not be removed until the scrotum swells and becomes red, with some tenderness of the testis, and effusion into the tunica vaginalis. When these effects have been produced, it may be cut and withdrawn, and the case treated in the same way as when the radical cure has been attempted by iodine injection—viz., by rest and antiphlogistic treatment. The length of time that it is necessary for the seton to be left in before sufficient, or even any, inflammatory action is produced varies considerably. In most instances, the proper amount of inflammation is excited in from twenty-four to thirty hours, but in other cases it may be left in for ten or twelve days, and give rise to but little inflammation, although a radical cure may result.—*Lancet, March* 9, 1850, *p.* 292.

109.—ON THE RADICAL CURE OF HYDROCELE.—By——LLOYD, Esq.,

The following is the substance of some interesting clinical remarks lately made by Mr. Lloyd at St. Bartholomew's Hospital, and reported in the 'Medical Times' for January 5th.

1. *Forcible injection of the sac of the tunica vaginalis.* He employed this plan some years ago in several cases among the out-patients of the hospital; at first he thought with success, but, with the exception of one case, the disease recurred in all; and what was the permanent result in that one, he had no opportunity of ascertaining.

2. *Acupuncture.* He had also given acupuncture a fair trial, but found it a very uncertain remedy: but oftener successful in children than in adults.

3. *Introduction of powder of hydrargyri nitr. oxidum into the sac.* This is the plan of treatment most relied on by Mr. Lloyd, and he has adopted it almost exclusively at the hospital for several years. It consists of the introduction into the sac, after it has been emptied of its contents, through the canula, of the substance finely levigated. This plan has been employed in a large number of cases, and hitherto without a failure, as well as without any untoward consequence whatever. It excites the necessary degree of inflammation, with as great, if not greater, certainty than the injection of wine, of solutions of sulphate of zinc, iodine, etc. It is, moreover, a much more convenient mode of treatment, as well as a saving of much time. The murcury is introduced, the patient is left to himself, and the surgeon is at once at liberty.

4. *Pressure.* Mr. Lloyd lately cured a case of hydrocele by pressure—tightly strapping up the tesitcle directly after evacuating the fluid. The pressure was kept up for three days, by which time hernia humoralis was established; since which the patient has gone on precisely in the same course as is usual after vinous injection.

5. *Vinous injection.* This method was adopted in he case which elicited the preceding remarks. After puncturing the sac, and drawing off about thirty ounces of greenish yellow fluid, Mr. Lloyd injected a pint of undiluted port wine, which was allowed to remain for fourteen minutes.—*London Journal of Medicine, Feb.* 1850, *p.* 190.

110.—ON INCONTINENCE OF URINE IN CHILDREN.—By JOHN SIMON, Esq., F. R. S. Surgeon to St. Thomas' Hospital.

[Mr. Simon directs attention to the fact, that when irritability of the bladder exists in children, it is usually attended with a copious cayenne-pepper deposit of lithic acid in the urine. In a clinical lecture upon this subject he says:—

Irritability of the bladder in children usually takes, with more or less completeness, the form of *incontinence of urine*: the child wets its bed. Whenever this symptom is presented to you, if you proceed to examine the urine (as in every such case you should do), you may pretty confidently expect to find copious crystals of lithic acid. This condition of the urine in children is very far from painless; and in severe cases the symptoms cannot at first sight be distinguished from those of calculus: the child makes water very often, and a little at a time, doubles itself up, and cries with the pain of each effort, and pinches and pulls its prepuce, just as it would with stone in the bladder. The pain experienced is a severe scalding in the urethra, and sometimes this passage will be so much irritated as to inflame and secrete pus. You have recently seen a case under treatment in Abraham ward, which, though not one of incontinence of urine, (for it was in an adult), will yet serve to show you the manner of dealing with such inconveniences, generally, as to depend on the passage of crystals of lithic acid in the urine. The patient, Wm. Matthews, aged twenty-two, had for two or three years suffered occasionally with symptoms, which make it probable that he has a calculus lodged in his left kidney; but the immediate cause of his admission to the hospital (Dec. 18), was the circumstance of his then habitually passing lithic acid gravel, occasionally mixed with blood. His urination was frequent and painful. His pulse was feeble, and he was of little muscular power; his skin acted fairly; his tongue was white and coated; his bowels a little constipated. I ordered him five grains of Plummer's pill every night till his tongue was quite clean, and then changed the treatment, giving him quin. disulph. gr. ii. twice a day, and potass. bicarbon. half a drachm, five hours after his chief meal. He left the hospital, after a month's stay, quite free from uneasiness in his urinary organs, and materially improved in general health.

This case will illustrate to you the sort of treatment which I generally pursue in similar instances of chemical derangement of the urine. If the tongue is coated, and if (as is usually the case with children) the intestinal secretions are unhealthy, I give hydrarg. c. creta, or some other preparation of mercury, till that evil is remedied; I then commence the exhibition of alkalies, giving usually a single large dose daily, after the completion of the digestion of the chief meal of the day, and almost invariably I find it highly advantageous to give quinine twice a day during the same period. In my hands it has answered far better than any preparation of iron, and especially so in the combination I have mentioned. I give it usually before breakfast and before dinner, and the alkali in copious solution five hours after the latter meal. Extreme attention to the quantity, quality, and simplicity of the diet, is essential.

With this treatment you will seldom, I think, have occasion to resort to blistering over the sacrum and other measures of a similar nature, which have been recommended for the cure of incontinence of urine in children.—*Lancet, March* 9, 1850, *p.* 290.

411.—TABLE FOR EXAMINING URINARY CALCULI.—By Dr. H. Bence Jones, F. R. S., &c.

1. *By Heat.*	2. *By Acids.*	3. *By Alkalies.*	*Nature of the Calculus.*	*Special Tests.*
Destroyed by heat.	With nitric acid, red.	Soluble in carbonate of potash, evolving ammonia.	Urate of ammonia.	Solub'e in water, when boiled. Solution in water, with a few drops of ammonia, evaporated, crystallizes in needles, (microscopic.)
		Soluble in carbonate of potash, evolving no ammonia.	Uric acid.	Solution in caustic ammonia or potash, on the addition of an excess of acid crystallizes in angular crystals. Not soluble in water.
	With nitric acid, not red.	In ammonia soluble, crystallising when evaporated.	Cystine.	Soluble in strong caustic potash; the solution, boiled for a few moments on the addition of a drop of dilute acetate of lead gives sulphuret of lead.
		In ammonia with difficulty soluble, not crystalling.	Fibrin.	With nitric acid becomes bright yellow. Solution in caustic potash precipitible by acetic acid in amorphous form.
Not destroyed by heat.	With hydrochloric acid soluble; before heating effervesces.	Solution in acid, when neutralized, gives a precipitate, with carbonated alkalies and oxalate of ammonia.	Carbonate of lime.	Soluble in dilute acetic acid, with effervescence.
	With hydrochloric acid soluble; after heating effervesces.	Solution in acid, when neutralized, gives a precipitate with carbonated alkalies and oxalate of ammonia.	Oxalate of lime.	Insoluble in acetic acid. Boiled with carbonate of soda, oxalate of soda is dissolved, precipitated by chloride of calcium.
	With hydrochloric acid soluble; without effervescence with or without heat.	Solution in acid, with excess of ammonia gives a crystalline precipitate.	Phosphate of ammonia, and magnesia	With half its bulk of phosphate of lime, (bone-earth,) is very fusible by the blow-pipe.
		Solution in acid, with excess of ammonia gives an amorphous precipitate.	Phosphate of lime.	With twice its bulk of phosphate of ammonia and magnesia, is very fusible by the blow-pipe.
Not acted on.	Not acted on.	Not acted on.	Silicia.	Fused with twice its bulk of carbonate of soda, forms glass, soluble in water, precipitable by hydrochloric acid.

Lancet, Feb. 2, 1850, p. 135.

DISEASES OF THE SKIN.

112.—ON THE USE OF ACETATE OF POTASH IN SKIN DISEASES.—By Dr. J. A. EASTON, Physician to the Glasgow Infirmary.

[Dr. Easton was led to the employment of acetate of potash in skin diseases, from reading the lectures of Dr. Golding Bird, delivered in 1848, before the College of Physicians (See 'Retrospect', Vol. XVIII., p. 55.) The remedy was used by Dr. E. in cases of Psoriasis, Lepra, and Eczema; and not only was the treatment in every instance successful, but the period required for the cure was considerably less than it is under the use of ordinary remedies. The dose of the acetate of potash was usually half a drachm three times a day. Dr. Easton makes the following remarks on the effects and modus operandi of the medicine:]

In the first place, the administration of the salt was followed by a great increase in the amount of urine. Making allowance for difference in season, difference in the state of the atmosphere, and for other causes which are known to influence the secretion of urine, I need scarcely remind you, that the average quantity voided during twenty-four hours,—and I certainly do not take the lowest standard—is about 40 ounces, or 2½ pounds. Now, the smallest amount of urine which was voided in the cases under review, was 54 ounces; while the greatest was 7½ pounds, or 120 ounces,—there having been, in the case in which the amount was lowest, an increase of 14 ounces; and in those cases in which it was highest, an augmentation of 80 ounces over the ordinary quantity. These facts speak conclusively, I think, as to the diuretic power of the acetate of potash. But the term diuretic is of vague signification,—at all events, two very different results follow the administration of different classes of remedies, each of which is comprehended under the general appellation of diuretics. Thus, some of these increase merely the amount of the *water* of the urine; others, the amount of its *solid constituents*, urea, lithic acid, and the salts. Under the former may be ranked broom, juniper, squill, digitalis, and to use the language of Dr Golding Bird, "all those agents which out of the body exert no chemical effect on animal matter. Such substances, which Dr. Bird calls renal hydragogues, appear to influence exclusively the Malpighian bodies of the kidneys,—that delicate expanse of capillaries to which, as has been shown by Mr. Bowman, has been entrusted the duty of separating the water that is discharged from the blood by the renal glands. I am of opinion, then, and the facts submitted warrant the conclusion, that the acetate of potash increases the water of the urine,—in other words, that it acts as a renal hydragogue. But it performs, when administered, a more important part in the animal economy, and renders more essential service in the removal of disease than what is imparted by its simply hydragogue influence; and this leads me to consider another effect of the salt, which I am anxious to call attention to, as having been manifested in the cases under consideration.

II. It was formerly remarked that some of the medicines called diuretics increase the quantity of the solid constituents of the urine, and I now proceed to show in the second place, that the acetate of potash posseses this property in so remarkable a degree, as fully to entitle it to be considered a renal alterative or blood depurant, as well as a renal hydragogue. The elimination from the blood of the solid constituents found in the urine, may be considered the function of the kidney *par excellence*, for, while this gland undoubtedly separates superfluous water from the circulating mass, it cannot be said, if I may be allowed the expression, to possess a monopoly in that respect, seeing that superfluous water is likewise discharged by the lungs and the skin. But it is specially—I may say exclusively—the office of the kidney, as well to de-acidify the blood, as to rid it of redundant nitrogen,—effecting the former of these objects by loading the urine with acid salts; the latter, by elaborating and excreting urea and lithic acid. Accordingly, the amount of these nitrogenous compounds in the urine, both of which, according to Dr. Bird, are produced from the metamorphosis of nitrogenised elements of worn-out tissues or mal-assimilated food, may be assumed as a measure of the amount of the destructive assimilation of nitrogenised tissues or other matters in a given time; for it may be regarded as a general exceptionless fact, and be enunciated with the emphasis of a general law, that all soluble matters in the blood, which are either not able, or are not needed to contribute to the growth and reparation of the tissues, are ejected by the kidneys. Now, while the investigations of Mr. Bowman have shown, as already stated, that the Malpighian capillaries separate the water of the urine, it has also been established by the same distinguished physiologist, that the separation of the solid constituents, or what may be called the peculiar urinous principles, is effected by the cells which line the tortous uriniferous tubes, exercising their secreting power for that purpose on the blood of the portal capillary plexus, with which the bodies of these tubes are in intimate contact. The amount of these urinous principles influences, of course, the destiny of the urine, and while the exact amount of them which is voided in a given time can only be determined by a quantitative analysis of that fluid, still, by attending to its specific gravity, we can ascertain whether they be above or below the normal amount. The specific gravity of water being estimated at 1·000, that of healthy urine ranges, as is generally understood, between 1·015 and 1·025; but, from a very pains-taking and very extensive observation of this matter in our hospital, my friend and colleague, Dr. MacGregor, whose original researches into the pathology of diabetes entitle him to all credit for accuracy and trustworthiness, has came to the conclusion, that 1·016 is the number which expresses more correctly than any other the specific gravity of healthy urine. To the correctness of this statement my own little knowledge of this point leads me to subscribe. If, then, 40 oz. of urine, of sp. grav. 1·016, be voided on an average of twenty-four hours, is there any mode short of performing a quantitative analysis—a proceeding not likely, for many reasons, to be had recourse to generally—by which we can estimate more precisely than by merely contrasting the difference between 1·000 and 1·016, the waste of tissue which has taken place during that period in the noiseless laboratory of the organism? On this point Dr. Bird supplies information so practically important that I make no apology for quoting from him nearly *verbatim*. After urging the necessity of ascertaining the integrity of the blood-depurating function of the kidney, and acknowledging, at the same time, the practical difficulties of doing so by evaporating the urine to as dry an extract as can be obtained, he calls attention to the advantages presented by the more rapid and easy determination of the quantity of solids from the specific gravity of the urine, and then subjoins a table, which he has constructed for the purpose of ascertaining that point. The peculiarities and the mode of applying this table to practical purposes, will be best gathered from the following sentences:—

Thus, if the specific gravity of any specimen of urine be expressed in four figures, the two last will indicate the quantity of solids in a fluid ounce of the urine, within an error of little more than a grain, when the density does not exceed 1,030; above that number, the error is a little greater. To illustrate this, let us suppose we are called to a patient, the integrity of the depurating functions of whose kidneys we are anxious to learn. The quantity of the urine excreted in twenty hours amounts, we will suppose, to three pints, or sixty ounces, and the density of the mixed specimens passed in the time alluded to is 1·020; now we merely have to multiply the number of ounces of urine by the two last figures of the specific gravity, to learn the quantity of solids excreted, or 60×20=1200 grains."

Now, bearing in mind the characteristic function of the kidney, and that the measure of its activity as a blood-depurating organ may be calculated by the specific gravity of the urine, let us see how far the function in question was influenced by the acetate of potash in the cases under consideration; in other words, to what extent the *solid constituents*, as well as the *water*, of the urine, were increase by that salt. In the cases in which the least urine was voided—being 54 oz. in the lowest, and 56 oz. in the second lowest, the specific gravity was respectively 1·019 and 1·017; while in those in which the amount was highest, the specific gravity was 1·012 in one of them, 1 014 in the other—the average quantity voided by each of these patients having been 120 oz. To those who take but a superficial view of this matter, the results just stated in reference to the specific gravity in these cases—particularly in reference to that of the two last—may apper inconsistent with the statement that the acetate of potash increases the solid constituents of the urine, and threby promotes the depuration of the blood. If such be the case, why, it may be asked, is the specific gravity not above the normal standard, instead of being below it? A moment's reflection will explain the reason, and show that the salt under consideration acts powerfully in promoting the elimination of those peculiar urinous principles which result from the secondary destructive assimilation of effete tissue, mal-assimilated food, and all abnormal products of low vitality and imperfect organization. In all the cases the amount of water holding these solid constituents in solution was materially increased; and it must never be forgotten that, if the *same amount* of solid matter be dissolved in a larger or smaller quantity of water, the specific gravity will be proportionally lower or higher. Thus, when the menstruum is much increased, the specific gravity may not be above the normal standard, and yet the activity of the kidneys, as blood-depurating organs, may be very great; for with the increased amouut of water, there is washed out from the blood an increase of the solid urinous constituents also; and yet, as these are not in a comparatively concentrated solution, but diffused through a large amount of menstruum, the density may relatively be not higher than usual—nay, it may ever be lower. Connecting this fact, then, with Dr. Rird's table, and keeping both steadily in view, we shall find that, when 54 ounces of urine were voided, of the sp. grav. 1 019. the blood was depurated to the extent of 991 grains in twenty-four hours; while, when 120 oz. were passed, of the sp. grav. 1·011, the separation of salts and waste of tissues, as indicated by the criterion of the specific gravity, amounted to 1440 grains in the same period. These results then, furnish I think, abundant evidence of the power which the acetate of potash possesses in promoting the metamorphosis of tissue, thereby increasing the solid constituents of the urine, and proportionally depurating the blood.

III. But, in the third place, this salt, which is so capable of accomplishing the metamorphosis, not only of ordinary effete tissue and mal-assimilated food,-but that, also, of many of those products of low vitality which either constitute, or are the manifestation of, a *materies morbi*,—this salt, I say, thus potent to alter and renovate, is itself altered in its progress through the laboratory of the organism, it being well known that the salts of the vegetable acids ere all converted in the system into carbonate, and as such are found in the urine. Now, I think it is susceptible of proof, having the strength almost of mathematical demonstration, that the benefit derived from tthe acetate of potash in such diseases as those I have spoken of, is owing substantially to its being converted into the carbonate of that alkali. But, before adverting to this change which the acetate of potash undergoes in the system, there are some circumstances connected with the action of the carbonate of potash that require to be noticed at this stage of our inquiry. That the carbonate of potash can exercise a transforming influence over organic compounds out of the body is undeniable. Thus, albumen, digested with an alkali, is broken up into secondary compounds, yielding leucine, formic acid, and the bodies allied to gelatine, called protid and erythroprotid. In like manner casein is broken up into tyrosin, leucine, valerianic acid, and other substances. These being some of the effects which this salt produces out of the body, is to much to presume, with Dr. Golding Bird, "that, when we cause an alkaline carbonate to circulate through the blood, it exerts an influence on the nascent elements of those matters less highly influenced by life, allied to that which it exerts on dead matter, aids their resolution into substances allied to those produced out of the the body, and actually causes the matter, to assume so soluble a form as to allow of its ready excretion?"

It may be urged, if the beneficial results spoken of be owing to the circulation of the carbonate uf potash in the blood, why not administer the carbonate from the first, rather than trust to its production in the system from the decomposition of the acetate?

The answer to this objection is found in the fact, that the exhibition of the carbonate as carbonate does not produce the effects which follow the administration of the acetate. No doubt the urine may be rendered alkaline by the use of the carbonate, and the aggregate quantity of the excretion may be somewhat increased—in short, the carbonate may alter the reaction of the urine, may act occasionally as a renal hydragogue, but very inefficiently as a renal alterative. The effects of these salts, and the theory deducible from these effects, may be thus expressed in syllogistic phraseology, slightly modified. The acetate of potash increases the solid constituents of the urine; the acetate of potash is converted in the system into carbonate of potash; the carbonate of potash does not increase (materially) the solid constituents of the urine; *ergo*, the effect on the urine of the acetate of potash is due to its conversion into carbonate. The inquiry being thus narrowed, and reduced, as it were, to a focus, it falls, I think, within the scope of legitimate inference to conclude, that the physiological action and therapeutic efficacy of the salt are connected in some manner—unknown, I admit. at present—with the metamorphosis which takes place in itself. With the view of elucidating this matter a little, it may be advisable to look at the chemical composition of the acetate, and the difference which exists in that respect between it and the carbonate. Putting the base out of view as being merely allied to a different acid, we find that acetic acid is composed of—

$$C_4 \qquad H_3 \qquad O_3,$$

and that carbonic acid is composed of—

$$C \qquad\qquad O_2.$$

Now, as the hydrogen and oxygen are in equal proportions in the acetic acid, it is clear that these elements will unite to form water, and will leave, consequently, four atoms of free carbon to unite with any body, for which, of course, it has an affinity. But we are not left in doubt as to the individuality of the body with which the carbon combines; for we find that carbonic has been substituted for acetic acid; and we know that this could only have resulted from the union of carbon with oxygen. Nay, more, we know, not only that the carbon has united with oxygen, but we know, further, that eight atoms of oxygen must have been furnished to convert the four equivalents of carbon of every atom of acetic acid into carbonic acid. But these changes which acetic acid undergoes will be made more apparent from the subjoined diagram:—

Conversion of Acetic Acid into Carbonic Acid and Water.

1 eq. Acetic Acid,	C_4	O_3	H_3	4 eq. Carbonic Acid,	C_4	O_8	—
8 eq. Oxygen,	—	O_8	—	3 eq. Water, . . .	—	O_3	H_3
Total, . . .	C_4	O_{11}	H_3	Total, ...	C_4	O_{11}	H_3

It becomes a matter of great interest, then, though unfortunately one of great difficulty also, to ascertain whence this large amount of oxygen is supplied. Any opinion, however, on this point, must, in the present state of knowledge, be purely conjectural; yet, at the risk of appearing presumptuous, I shall hazard a few speculations on the subject, which, though they may not carry conviction, will, I hope, excite inquiry, elicit discussion, and perhaps conduct to knowledge; for, to use the beautiful language of Bulwer, it should ever be remembered that the agitation of thought is the beginning of truth.

There are, I think, only three sources whence the oxygen can be furnished—from the food, the atmosphere, or the organism, including, by this last term, all the products, normal and abnormal, which exist for the time being in the system. As, for obvious reasons, there was no great likelihood of the oxygen having been derived from the food of those patients whose cases have formed the basis of these observations, I pass at once to the consideration of the second and third named sources. It is the opinion of Liebig, that the salts of the vegetable acids, which are converted in the system into carbonates, derive the supply of oxygen necessary for that purpose during respiration. This, however, is given, if I mistake not, merely as an opinion—certainly not supported by demonstrative evidence, and, if I recollect rightly, not even by a reason *why* these salts should appropriate oxygen in their passage though the lungs; and, with all deference to so great a master in science, while no proof is afforded in favour of the opinion, there are one or two circumstances which, I think, are entitled to consideration as militating against it. In the first place, the speculation assumes that the decomposition and reconstruction of these salts are effected in the lungs, and leaves out of view the more likely influence of digestion in effecting such changes. Again, this opinion presupposes a greater activity of the respiratory process while such salts are making the transit of the lungs—an event not appreciable, certainly, by any increase in the number of the respirations. And, if more oxygen be not withdrawn from the air, and it be maintained, notwithstanding, that the supply of the gas necessary for converting acetates, &c., into carbonates, is furnished during respiration, then the advocates of that opinion are shut up to the conclusion that, in order to effect the alteration of certain salts, some part or parts of the organism are deprived of a portion, or, for anything we know to the contray, of *all* their oxygen—a procedure scarcely in accordance with the general tendency of nature's operations. A theory at least as plausible, I conceive, as this, and one as much in unison with ascertained facts, can be constructed, by supposing that the necessary oxygen is derived from the organism itself. That the effete portion of the organism is being continually disintegrated and resolved into a variety of new forms in the capillary laboratory of the system, is well known and undeniable; is it too much, therefore, to suppose that, amid these ever-varying transitions, a vegetable acid may be broken up and altered, by being brought within the sphere of nascent oxygen, evolved from compounds yielding to the resistless influence of the secondary destructive assimilation? This, however, is all theory—and, probably, very erroneous and untenable theory—and therefore, though agreeing with Dr. Whewell, that "false theory often proves more advantageous to science than the absence of theory," I shall descend from the airy region of speculation, and leave to others the task of solving this interesting problem in the chemistry of therapeutics.

I have thus submitted evidence, that the acetate of potash is a valuable agent in certain cutaneous diseases; I have also proved that it increases the water of the urine, and its solid constituents likewise; have shown that it is itself converted into a salt, which dissolves and transforms tissues which are but imperfectly organised; and lastly, I have endeavored to show, that the beneficial effects of the medicine are in some way, yet unknown, connected with the change which is effected in itself.

Whatever opinion may be entertained of the theoretical conjectures I have hazarded, I trust my readers will not overlook the practical observations which have been presented likewise; and, in the hope that these will be submitted to the test of experience, I respectfully urge them on their consideration.—*Monthly Journal, May,* 1850, *p,* 422.

113.—USE OF PHOSPHORUS IN DISEASES OF THE SKIN.—By Dr. T. H. Burgess.

There is a remedy which exercises a powerful influence on the cutaneous exhalents, and which I can specially recommend in the treatment of the more rebellious forms of diseases of the skin—namely phosphorus. My attention was first directed to this remedial agent during the period of the cholera in 1832, and I then found it successful, when every other remedy had failed, in several cases of that disease, where the vital powers seemed exhausted, and the patient in the lowest stage of collapse. In these cases, it appeared to act as a violent stimulant, principally through the nervous system, accellerating the circulation, and exalting the muscular irritability in the highest degree. I can now recommend it as one of the most valuable medicinal agents we possess in those inveterate cutaneous diseases—leprosy, psoriasis, lupus—in which the skin seems to adapt itself to the morbid condition, which it retains with singular tenacity against all the usual methods of treatment.

The *phosphorus* treatment of these maladies may be either internal or external. The best method of administering the remedy internally is dissolved in oil or ether, and the phosporated oil or ether then mixed up with powdered gum arabic and mint water. Camphorated lard is the most appropriate vehicle for applying phosphorus externally. Its energetic revulsive properties may likewise be turned to account in certain diseased conditions of the skin. Phosphorus, the iodide of arsenic, cantharides, and the biniodide of mercury, are the most powerful internal remedies for the skin diseases we possess.—*Monthly Journal, Feb.* 1850, *p.* 149.

114.—USE OF NITRATE OF SILVER IN THE TREATMENT OF ULCERS, WOUNDS, ERYSIPELAS, &c.—By John Higginbottom, Esq., Nottingham.

[In recommending the local application of nitrate of silver in cases of wounds, &c., and in all acute superficial inflammation, Mr. Higginbottom first endeavours to combat the idea that this preparation is a custic or destructive agent. He says :]

The nitrate of silver is not a caustic, in any sense of the word. It subdues inflammation, and induces resolution, and the healing process. It preserves, and does not destroy, the part to which it is applied. If we compare a caustic, as the hydrate of potassa, with the nitrate of silver, we find that the hydrate of potassa destroys, and induces a slough and the ulcerative process; but if we touch a part with the nitrate of silver, the eschar remains for a time, and then falls off, leaving the subjacent parts healed.

If an ulcerated surface, secreting pus, be touched by the nitrate of silver, the succeeding discharge is immediately converted into lymph: it is the property of the hydrate of potassa, on the contrary, to induce not only ulceration but suppuration. In short, the peculiar properties of the nitrate of silver have long been kept unknown to us by the designation of lunar caustic, affording the most striking instance of the influence of a term, or of a classification, upon the human mind. The nitrate of silver and the hydrate of potassa, (as indeed all custics,) are as the poles to each other; the first preserves, the second destroys; the first induces cicatrization, the second ulceration.

I have for some years past used the nitrate of silver in solution, as well as in the solid state, finding the concentrated solution more convenient for application, where the nitrate of silver has to be applied on a considerable surface, as in erysipelas, &c. The following is the formula I have of late used: nitrate of silver, four scruples; distilled water, four drachms. Put the nitrate of silver into a half-ounce bottle, add the distilled water; the nitrate of silver will be dissolved in a short time, and if rightly prepared the solution will be clear and transparent; this quantity may be kept conveniently in the pocket of the surgeon, for daily use. The solution may be applied with a small piece of sponge, an inch in length, and one-third of an inch in breadth, stitched on the eye at the end of a common silver probe; this makes a most convenient instrument, which may be kept in the pocket-case; it is not only useful for external inflammation, but can be used to internal parts of the throat, &c. Precaution should be taken to wash the sponge *well* with water after using it.

When the solid form of the nitrate of silver is used, it is necessary to moisten the surface to which it is applied, slightly, with pure water, and apply a long stick of the nitrate of silver *flat* upon the moistened surface, taking care that it be applied to every affected part.

It is necessary, for the successful application of the initrate of silver, that the surface of the skin be free from any oleaginous matter, loose, cuticle, or any other extraneous substance; the parts should be well washed with soap and water, and afterwards with water alone, to remove any particle of soap remaining.

It is essential to know the precise effect of the nitrate of silver, in the different degrees of its application. If the nitrate of silver be passed once slightly over the moistened skin of any part, except the hands or soles of the feet, (upon which the cuticle is thicker than elsewhere,) it induces an eschar, simply; if it be passed over the surface twice or thrice, to the eschar will be added some vesication; if more still, there will be vesication only. In the first place, there will be no pain; in the second and last, there will be soreness proportionate to the degree of vesication.

It is essential to the success of this plan of treatment, that these observations be kept constantly in view.

I shall now describe the mode of application of the nitrate of silver in the treatment:—

Of recent bruised wounds of the skin, &c.—In recent bruised wounds of the skin, the nitrate of silver should be applied on the wound, taking care to leave no spot untouched, and upon the surrounding skin, to the breadth of one-third of an inch, in such a manner as to induce an eschar, without vesication. Any moisture which may remain upon the wound is then to be removed by gently wiping the part with a little linen or lint, and the skin surrounding that on which the nitrate of silver was applied is to be moistened, and covered with gold-beater's skin, so that the whole may be protected from accident; the parts are then to be kept cool, free from covering, and exposed to the air.

This is usually all the treatment required in this kind of injury. It will be generally found, that an adherent eschar is formed, and that no further application or attention is required, excepting in old people, in whom the skin is sometimes irritable from various causes; in this case, a little fluid will form under the edges of the eschar, and will require to be evacuated by a small puncture, the gold-beater's skin being removed for this purpose, and then re-applied.

If the eschar be removed by accident at any time, the application of the nitrate of silver must be repeated as before. If due care be taken to avoid this kind of accident, it will not in general be found necessary to enjoin rest.

Of small ulcers.—The same method of applying the nitrate of silver may be used in small ulcers as in bruised wounds, particularly in exposed situasituations, as on the face, head, and hands; in these situations the eschar often becomes adherent from the first application, but should the first attempt fail, and the eschar be unadherent, from fluid forming under it, a poultice of bread-and-water should be applied for eighteen or twenty-four hours, to remove the eschar; when this is done, it should be treated as in larger ulcers, hereafter directed, which generally affects a cure with one or two applications.

Of large ulcers.—I have abandoned the attempt of healing large ulcers by the unadherent eschar, on account of the inconvenience and trouble attending the evacuation of the fluid from beneath the eschar, which is daily necessary to insure an adherent eschar.

The best treatment is as follows:—Apply the nitrate of silver twice over the ulcer and surrounding skin, then cover the ulcer with a piece of black lint,* and upon it a plaster of neutral ointment,† spread rather thick on linen, a compress of linen, and a calico roller lightly applied to secure the whole. This plan is attended with much less trouble, and requires the attention of the surgeon only every third or fourth day. The same remark may be here made of ulcers as of inflammation, which is of great practical importance respecting the action of the nitrate of silver, that its influence is exerted for three days in an active state, and declines on the fourth; on that account, any intermediate dressings are unnecessary. In small ulcers, a second application of the nitrate of silver in substance is often not necessary, as the black lint, by absorbing the moisture, becomes firmly adherent, and remains on the ulcer until it is healed; if not healed when the lint comes away, a repeated dressing every fourth day, of black lint and neutral ointment, is required.

Of old ulcers of the legs.—Old ulcers of the legs have long been the opprobrium of surgery, and I recollect the following remark made in one of our periodical works soon after the publication of my essay 'On the Use of the Nitrate of Silver,' that "old ulcers of the legs in 1830 would be old ulcers of the legs in 1840;" that no improvement would be made in the surgical treatment.

After the lapse of nearly twenty years, I am led to conclude that there has been a very manifest improvement in that department of surgery—not so much by the permanent cure of old ulcers of the legs by the use of the nitrate of silver as I anticipated, but by what is far better—the prevention by the early use of that remedy.

I have no doubt that if these directions for the treatment of external inflammation, in bruised wounds, and also that of recent ulcers, with the occasional assistance of graduated pressure, were followed, we should seldom have severe cases of old ulcers of the legs.

From my own observations and inquiry, I am led to believe that they have materially decreased in number in this locality, both in hospital and private practice; indeed, so much so, that if I were to commence my treatment as I did twenty-four years ago, I should have great difficulty in finding one-half the cases I then readily obtained, notwithstanding there is an increase of one-third more of inhabitants.

Of ulcers attended with inflammation.—If ulcers attended with inflammation should occasion constitutional disorder, I would prescribe the patient an emetic of ipecacuanha, a calomel pill, followed by an active saline purgative; to apply bread-and-water poultice, every eight hours, on the ulcer; and cloths, moistened with cold water, constantly over it and the inflamed part, as an evaporating lotion; and to keep in bed for twenty-four or thirty-six hours.

After this period, the treatment as directed for ulcers, with the nitrate of silver, black lint, and neutral ointment, &c., may be generally pursued. Should there still be swelling or œdema arising from the ulcer, it will be necessary to enjoin absolute rest in bed, or under such circumstances the ulcer will not heal.

Of punctured wounds, bites, and stings.—In recent punctured wounds the orifice must be first examined. If there be any extraneous body within it, or loose skin surrounding it, they should be first removed. A drop of water should be put on the puncture, and the surrounding skin slightly moistened. The nitrate of silver is to be applied to the former, until some pain be experienced; and over the latter lightly, so as not to induce vesication. It should be applied to the skin for an inch round the puncture, and to a greater extent, if the swelling exceeds this space. The part is then to be exposed to the air.

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* Black lint:—Nitrate of silver, two drachms; distilled water, four ounces. Mix, and make a solution. Saturate an ounce of fine lint in this solution; then let the lint be exposed in a flat, shallow vessel, to allow it to dry, by evaporation.

† Neutral ointment:—Lead plaster, eight ounces; olive oil, eight ounces; prepared chalk, four ounces; distilled vinegar, eight ounces. The acetic acid and the chalk must be well mixed in a mortar, and the lead plaster and the olive oil, previously slowly melted together, are to be added. The whole is then to be stirred together until cool.

These cases are generally adherent from the first application of the nitrate of silver; but I have sometimes found the eschar to separate from the wound before it was quite healed, owing to its conical form; it is then only necessary to repeat the application of the nitrate of silver slightly, to complete the cure.

At a later period of punctured wounds, inflammation is usually present; the punctured orifice is nearly closed by the swelling, and a little pus or fluid has generally formed within. A slight pressure is to be applied to evacuate this fluid, a drop of water should be put on the orifice, and the nitrate of silver is then to be well applied within the puncture and upon and a little beyond the surrounding inflamed skin, as before directed, and the parts are to be exposed to dry. In this manner an adherent eschar is formed, and the inflammation subsides. If there be any vesication it may be simply left to nature; the fluid is soon absorbed or evaporated.

If there be reason to suppose that an abscess has formed deeply, it must be opened freely with the lancet, and the nitrate of silver is then to be applied on the cavity and on the surrounding inflamed or swelled skin. A poultice of bread-and-water, and cold water as a lotion, is then to be applied over the whole. The application of the nitrate of silver may be repeated every second or third day if the swelling or inflammation require it, and the cold poultice may be renewed every eight hours,

I have several times applied the nitrate of silver over an inflamed surface when I was not aware that suppuration had taken place. Even in these instances an immediate check was given to the surrounding inflammation, and relief to the pain, but two or three days afterwards there was increase of swelling attended by some pain, which is not usual excepting where there is matter or some extraneous body underneath.

In these cases a free incision must be made with the lancet, and afterwards apply the nitrate of silver and cold poultice.

In doubtful cases, where suppuration may be expected, it is advisable to apply a poultice after the nitrate of silver, as the part may be in a fitter state to detect any matter, than if a hard eschar be over it.

The bites of animals and the stings of insects have a speedy remedy in the nitrate of silver, if applied as directed in punctured wounds.

Of wounds received in dissection.—Previous to a post-mortem examination, as a precautionary measure, any sores or scratches on the fingers or hands should have the nitrate of silver applied to them to form an eschar.

After a post-mortem examination, wash the hands well in tepid water, then bathe them with salt and water, so that any small wound or abrasion may be detected by the smarting pain occasioned by its application; this is especially desirable after a post-mortem examination of abdominal inflammation and of puerperal patients, as a number of fatal cases have occurred from very slight wounds unobserved at the time. Every suspicious spot should be then moistened with a little water, and the nitrate of silver freely applied on the affected parts, and over the surrounding skin, to form an eschar. This plan will be a most effectual preventitive of mischief in recent injuries.

If the puncture be deep, it will be necessary to suck the part well first, then put a drop of pure water on the orifice of the puncture, and apply the nitrate of silver well, so as to occasion a smarting pain within the wound, and apply it lightly on the surrounding skin.

In the second stage, when the wound becomes painful or inflamed, there is a tumour or elevation of the skin, the removal of the small tumour with the lancet, or a crucial incision must be made through it, and then apply the nitrate of silver on the wound, and on, and beyond; the inflamed and swollen parts; if, on the following or subsequent days, the inflammation spreads, the application of the nitrate of silver should be repeated; an ipecacuanha emetic, followed by a purgative, would be desirable, if the digestive organs are affected.

In the third stage, inflammation is rapidly spreading, violent constitutional symptoms are present, and the violent knocking pain in the head is peculiar to this stage. Venesection, ipecacuanha emetic, followed by a purgative, two grains of calomel with two grains of James' powder, every three or four hours, till the mouth is affected, appear to be the best treatment. The nitrate of silver should be applied freely on all the inflamed surface, and along the inflamed absorbents.

Wounds from the bites of rabid animals.—I read a paper some time ago, in a work on veterinary surgery, where the writer mentions his entire confidence in the application of the nitrate of silver to the bites of rabid animals.

An objection has been made to the excision of the part alone, on account of the danger of the virus from the bitten wound being conveyed to the recent wound made with the scalpel. To avoid this, the parts may first be well washed with warm water, with the assistance of Read's, or any powerful syringe, to remove the saliva away from the wound; the nitrate of silver should then be freely applied within the wound, after that the bitten part should be removed with the scalpel, and afterwards apply the nitrate of silver again to the wound, making doubly sure of having the poisoned parts removed. The sores to be healed by eschar.

Of lacerated wounds.—After the wound has been well cleansed, and foreign matters removed, the nitrate of silver must be applied close upon the irregular edges of the wound, but not within the wound, and on the surrounding skin; afterwards the parts should be brought into approximation, by straps of adhesive plaster, to be healed by the first intention. Should the laceration be considerable, the interrupted suture may be used with the same success and safety as in an incised wound, but the suture must be applied *before* the application of the nitrate of silver; the nitrate of silver should be applied on the edges of the wound, on the *line* of the wound, and on the surrounding skin; the parts should be supported by adhesive straps, without any other covering; the ligature may be removed about the third day, and the nitrate of silver applied to the small orifices left, to prevent any ulceration.

Great advantages are derived from healing wounds, particularly on the face, by the aid of the nitrate of silver.

1. It prevents the irritation arising from the irregular edges of a lacerated wound; adhesive inflammation takes place, and the wound is healed by the first intention, as in an incised wound.

2. The inflammation, swelling, and irritative fever consequent on lacerated wounds are in a great degree prevented, and there being no ulcerative process, there is no loss of substance, so that unsightly scars, and raised cicatrices are prevented.

To arrest the hemorrhage from leech-bites.—Apply the point of a stick of the nitrate of silver firmly within the little orifice for a short time; then a small piece of black lint must be firmly pressed on the part with the finger for two or three minutes; by this means the bleeding is effectually stopped; the black lint becomes firmly adherent, adhesive inflammation is produced, and the lint does not separate till the leech-mark is healed.

Incised wounds.—Apply the nitrate of silver slightly on the skin surrounding the wound, *not within the wound*, and bring the edges of the wound together with adhesive plaster, or uninterrupted sutures; by this means any subsequent inflammation or swelling of the skin is prevented, and the wound heals by the first intention. In the operation for hare-lip, or in wounds on the face, adhesive inflammation is immediately produced by this treatment, and the cure safely effected. When the ligatures are removed, the small orifices remaining should be touched with the nitrate of silver, to prevent any ulceration.

Of erysipelas.—In very slight attacks of erysipelas, sometimes an active purgative and low diet will be sufficient to remove the disease without the application of the nitrate of silver; but if constitutional symptoms are present, it is the safest plan to use both constitutional remedies and the nitrate of silver simultaneously.

The constitutional remedies, as the case may require, are venesection, emetic, purgative, and repeated doses of chloride of mercury and James' powder. The nitrate of silver to be applied as follows:—Wash the affected parts well with soap and water, then with water alone, to remove any particle of soap remaining, afterwards wipe the parts dry with a soft cloth;—then apply the concentrated solution of the nitrate of silver two or three times over the whole inflamed surface, and beyond it on the surrounding healthy skin, to the extent of two or three inches. In about twelve hours it will be seen if the solution has been well applied. If any inflamed part be unaffected by it, it must be immediately reapplied to it. Sometimes even after the most decided application of the nitrate of silver, the inflammation may spread, but it is then generally much less severe, and it may be eventually checked by the repeated application of this remedy.

It is desirable to visit the patient every twelve hours, till the inflammation is subdued.

By this means, we have a complete control over the disease. If the erysipelas is attended by vesication, the vesicles should be broken and the nitrate of silver applied on the denuded, inflamed parts, but if the vesicles arise from the use of the nitrate of silver, they may be allowed to remain undisturbed.

In erysipelas of the face, when it is spreading on the forehead, or at all on the scalp, the head should be shaved as early as possible, that the extent of inflammation may be traced on the scalp, which often can only be detected by pain, or by œdema being felt on pressure with the finger.—The solution requires to be applied very freely all over the scalp, where it scarcely or never produces vesication.

When the inflammation has been subdued by an early use of the nitrate of silver, the constitutional symptoms have been immediately relieved; the constitutional disturbance is directly aggravated by the least of local inflammation, and in a few hours, after a decided application of the nitrate of silver, the inflammation has been arrested, and gradually subdued, and with it the constitutional symptoms cease.

Even in idiopathic erysipelas, there is no period of the disease when I would not apply the nitrate of silver; I have never in any cases seen metastasis or any other bad effect from the use of this important remedy; on the contrary, I think it the best local remedy to prevent such mischief.

On phlegmonous erysipelas.—An early application of the solution of nitrate of silver alone sometimes will be sufficient to check the progress of the inflammation.

If the inflammation be severe, attended with swelling, and the subcutaneous cellular tissue be much affected, a number of leeches should be applied on the inflamed part, or small incisions made with a lancet; a bread-and-water poultice applied, until the bleeding has ceased, then the concentrated solution to be applied freely upon and beyond the inflamed parts, and afterwards covered with a plaster of the neutral ointment, if suppuration be anticipated, if not, the parts should be exposed to the air, to form an eschar.

If the leech-marks or incisions afterwards become painful or irritable, a slight application of the nitrate of silver will be required.

By the above method of treatment, the inflammation is arrested, and subdued, the suppurative process often prevented, and long incisions unnecessary. Should the system be affected, ipecacuanha emetics, saline purgatives, and repeated doses of calomel with James' powder.

On inflammation of the absorbents.—Constitutional remedies are often required, as venesection, emetics, purgatives, &c., and an immediate attention to the origin of the disease. If from a foreign substance, it must be removed; if from an abscess, it must be freely opened; or from an irritable ulcer, the nitrate of silver should be applied, to destroy the irritation. The nitrate of silver should then be applied, either in substance or the concentrated solution, freely, upon the whole of the inflamed and swelled surface, along the lines of inflammation, and beyond them on the surrounding skin. By these means, in twenty-four hours, the disease is generally most effectually arrested in its progress, and the numerous abscesses often occasioned by this kind of inflammation prevented.

Phlegmonous inflammation.—Pure-phlegmonous inflammation will be often arrested and subdued by the early application of the nitrate of silver, without any other remedy; but if it has proceeded so far as to be doubtful whether suppuration has taken place or not, the inflammation will be arrested, and the suppuration more circumscribed and limited in its extent.

If the tumefaction and inflammation are not subdued in four days after the application, it will be found that suppuration has taken place, and that the use of the lancet will be required to open the abscess, after which the wound will more rapidly heal than if the nitrate had not been used. The cold poultice may be applied every eight hours, and the nitrate of silver every second or third day, as required.

Small irritable ulcers with varicose veins.—Fill the small ulcers lightly with scrapings of the black lint, and cover them with a plaster of the neutral ointment, and apply graduated pressure with a bandage on the leg; it often happens that an adherent eschar is formed after the first application, but if not, the remedy must be repeated every third or fourth day. A bandage or laced stocking should be continued.

Burns or Scalds.—In the first class of burns or scalds, where there is supercial inflammation, and in the second where there is simply vesication without destruction of the cutis, the appilcation of the nitrate of silver as directed in erysipelas, often effects a speedy cure; the vesicles should be removed and the nitrate of silver applied on the exposed cutis, to form an eschar. If future dressings are required the black lint and neutral ointment may be applied every third or fourth day. Should the burn or scald be exposed to friction on any part of the body, a plaster of the neutral ointment applied with a light bandage over it will be necessary.

In burns from the explosion of gunpowder particularly on the face, the mode of healing by eschar with the nitrate of silver is very successful.

Gangræna senilis.—An early application of the nitrate of silver is indispensable to give a chance of checking the progress of this dreadful disease. It has been used with decided success when the toes have assumed a dark colour, and become a little swollen, with purple vesications on the lower and outer part of the leg. The solid nitrate of silver may be applied (the affected parts being previously moistened with water) freely on the affected toes, and lightly on the surrounding healthy skin; and also on the denuded skin after the vesicles have been removed, so as to form an eschar. If successful, the eschar becomes adherent, the inflammation is subdued, and all further mischief prevented. In due time the eschar will be thrown off, leaving the parts underneath healed.

It will be desirable to give purgatives, and adhere to an antiphlogistic regimen during the cure.—*Lancet, Jan.* 19, 1850, *p.* 74.

115.—ON THE TREATMENT OF ERYSIPELAS BY COLLODION.—By Dr. John Snow, London.

[The application of an adhesive compound, in order to arrest inflammation of the skin, having been recommended by M Latour, of Paris, Dr. Snow makes the following remarks upon the subject:]

In a paper on 'Inflammation,' which was read at the Westminster Medical Society, and reported somewhat fully in 'The Lancet,' in the early part of 1843, I was led to recommend this treatment, from a consideration of the causes which promote the circulation in the capillary bloodvessels, as well as from the result of experiments by MM. Breschet and Becquerel, in which the skin of animals was covered with varnish, and from the effects of covering a portion of my own skin closely with oil-silk. The following passages are quoted from the report of that paper:—

"There was one indication which might be fulfilled with safety and advantage in every case of inflammation of the skin—that was, to stop the cutaneous transpiration, which, being the chief function of the skin, promoted the circulation in its capillaries, and thereby kept up its temperature. . . . . On this principle he believed that the benefit of water dressings and poultices chiefly depended, as well as the application of lunar caustic and of flour in erysipelas, the former making a dead, and in a great measure, an impermeable, membrane of the cuticle, and the latter likewise interfering with transpiration." ('Lancet,' Feb. 25, 1843, p. 805-6.)

Since the introduction of collodion, I have applied it in erysipelas, with apparently great advantage. In a case of erysipelas of the face and head, which occurred in a lady about thirty years of age, in April last year, this was the only local application. It was applied once every day, to the whole inflamed surface. The first application to every newly inflamed part always afforded immediate relief. At the end of six days the inflammation had quite diseppeared, and the patient was convalescent. It is the first stage of inflammation of the skin that protecting it from the air appears to be of most service.—*Lancet, April* 27, 1850, *p.* 502.

116.—ON VENEREAL CUTANEOUS ERUPTIONS.—By Bransby B. Cooper, Esq., F.R.S.

In this form of "secondary symptoms" a doubt always arises in my mind as to whether the eruption can be attributed to the immediate action of syphilis, or whether it may not be regarded as the result of a constitutional tendency, only developed by the action of the syphilitic poison, and the appearance of the eruption being also modified by the same agency. Perhaps the most common form of cutaneous eruption in syphilis is the papillary, as lichen, which is to be distinguished from the idiopathic disease by the dirty copper brown colour of the skin, and the peculiarly superficial appearance of the stain, which gives the idea that it may be easily removed by washing. It is also much less irritating than the ordinary disease. The papular is the form which the disease usually assumes in children. This eruption will sometimes pass into the pustular form, which renders its classification difficult; but still the specific colour sufficiently stamps it as a venereal eruption.

In this form of eruption, Plummer's pill, and large doses of sarsaparilla, are the remedies which I generally employ: sometimes, however, I give small doses of the bichloride of murcury, with the sarsaparilla, in the place of the Plummer's pill.

I think I have found the scaly eruptions appear next in order in point of frequency to the papular just described, and have sometimes seen pityriasis in the first eruption of venereal disease; but the character of the disease is then likewise marked by its peculiar copper colour: it sometimes commences as a smooth elevation or as a dirty blotch before it passes into its scaly condition.

Lepra and psoriasis are also common forms of secondary scaly eruptions, modified, however, in appearance by the venereal poison.

These squamous diseases I invariably treat with mercury, but have lately employed the mercury in combination with iodine and arsenic, under the form of Donovan's solution.

The tubercular form of the venereal disease comes next in order, and usually presents itself as acne, constituting a distinct hard inflamed tubercle, having a tendency to slowly suppurate. The tubercles appear especially on the forehead, face, neck, and shoulders, but rarely attack the lower parts of the trunk. Their specific characteristic is, as in the other kinds of eruption, indicated by peculiar dusky colour: the venereal taint is, however, sometimes very difficult to distinguish, when the eruption appears in those whose constitutions have been broken down by hard drinking; and the diagnosis is important, as mercury is the appropriate remedy when the disease is influenced by the venereal poison, but quite inappropriate when the disease appears as a consequence of dissipation. Lastly, there are two other forms of venereal cutaneous disease, but these have generally been considered as tertiary in character, although I confess that I do not distinctly understand what is meant by "tertiary symptoms;" but if it be true that these eruptions be neither capable of being propogated by inoculation nor hereditarily, they deserve a distinct place in the category of venereal disease; the eruptions to which I allude are impetigo and ecthyma of the pustular, and rupia of the vesicular order. These diseases are not to be treated by mercury, but by iodine and the iodide of potassium, and when the vital powers of the patient are greatly diminished, bark and the mineral acids are indicated; but generally change of air, especially to that of the sea-side, seems to prove the most effectual remedy, at the same time iodide of potassium ought again to be given when the constitution of the patient is sufficiently restored.—*Med. Gazette, Jan.* 11, 1850, *p.* 48.

117.—ON THE TREATMENT OF SCABIES BY LARD.—By Prof. BENNETT, Edinburgh.

Since the connection of scabies with a peculiar insect (*Acarus Scabiei*) has been understood it has been suggested that the good effects of sulphur ointment are not so much to be attributed to any specific properties of the sulphur, as to the destructive operations of the fatty matter, which, by stopping up the respiratory pores of the insect, causes its death. Some time ago I saw in the 'Annales de Thérapeutique,' an account of the treatment of scabies by M. Griffi of Sardinia, who cured the disease by the simple application of olive oil or lard. The following cases, which have occurred in the clinical wards, will illustrate the effects of this practice:—

Case 1.—A boy (of whose case I cannot at present find the record,) about ten years of age, entered the clinical ward at the commencement of last session, with the back of his hands covered with numerous ecthymatous pustules, associated with vesicles of scabies, which were most abundant between the fingers and on the wrists. They had existed for some weeks and caused great irritation and itching. The hands and wrists were ordered to be covered with simple lard morning and night. On the next day it was found that the parts were dry, and that he was continually irritating them by scratching. To prevent this, and to keep the parts moist, the hands and wrists were ordered to be enevloped in oil-silk bags. A continuance of this treatment for five days entirely removed the eruption.

Case II.—Anne Daly, aged 17, a bleacher, was admitted, November 20, 1849, with an eruption on the hands and flexor-surface of the arms, consisting of large ecthymatous pustules, mingled with numerous acuminated vesicles of scabies. These latter were most numerous between the fingers,. The disease was of twelve days' standing, and no contagion could be traced. The effected parts were ordered to be smeared with simple lard, and enveloped in oil-silk bags, as in the last case. This practice was continued until the 26th, when the pustules had disappeared, leaving bluish red spots devoid of cuticle. A few vesicles were still visible. In two more days these also had disappeared, although she was not dismissed until December 4th, when no trace of the eruption was discernible.

Case III.—James Monro, aged 20, admitted November 7th, 1848. His hands, arms, and lower portion of abdomen are scattered over with vesicular scabies. which everywhere produces the most intense itching, especially at night, and when near a fire. On the arms numerous hemorrhagic points and deep grooves, in connection with the vesicles, have been produced by scrathing. There are similar appearances on the abdomen. The hands and arms were ordered to be smeared with lard twice daily, and enveloped in oil-silk. In six days the eruption had disappeared from these parts. On the abdomen, however, it still continued, and the lard was then ordered to be also applied there. Here it could not be covered with oil-silk, and the surface was continually dry. Still great amelioration was produced, and he was discharged cured, November 28th.

Case IV.—There is at this moment in the clinical ward, a lad named John Harley, aged 17, a labourer's son, affected with intense emphysema and bronchitis, of which diseases it is unnecessary now to speak. On admission (December 3, 1849,) the hands flexor-surface of the arms, and abdomen, were, as you saw, closely covered with vesicular scabies, which induced great itching and scratching, and, as a result of the latter, grooves and bloody marks of the nails. On the 4th, the hands were smeared with lard, and enveloped in oil-silk, as in the former cases. On the 8th of December, the eruption on the hands and wrists was completely cured, but still continued in all its intensity on the arms and abdomen, clearly showing the curative power of the remedy. The lard was now ordered to be applied to the arms, and these to be enveloped in oil-silk to keep them moist. On the 15th, the arms were freed from the eruption. Lard was now ordered to be rubbed three times a day on the abdomen.

It is well known that scabies may be cured by numerous local applications, although experience has generally decided that sulphur-ointment is the one which is most certain and rapid in its action.

The cases above detailed, with several others which might have been cited, have satisfied me that the efficacy of the ointment is altogether dependent on the unctious matter, and that the sulphur has little to do with its therapeutic effects. It appeas to me important, however, that the parts should be kept moist, and that the use of oil-silk for this purpose, greatly facilitates the cure. The action of fat seems to render pustules, and visicles abortive, both disappearing in a few days, leaving the skin they covered slightly reddened, with the shrivelled walls of the pustule and vesicle more or less adherent to it.—*Monthly Journal, January*, 1850, *p*. 61.

118.—ON AN APPARATUS FOR FUMIGATING THE SCALP, IN SOME CHRONIC DISEASES OF THAT REGION. By Dr. T. BURGESS.

[In a recent work on 'Diseases of the Skin of the Exposed Surfaces,' Dr. Burgess has recommended fumigation of the scalp in certain of its diseases. He thus describes the apparatus he uses for that purpose:]

The vapour apparatus is extremely simple. It consists of a tin jar, about ten inches by four, with a conducting tube, on which is placed a stop-cock, for the purpose of diluting the vapour, or turning it off, and an elastic cap of vulcanized india-rubber, which fits closely to the head, so as to prevent the vapour from escaping. The great majority of diseases of the skin are constitutional, and those of the scalp are not an exception to the rule. Yet every practioner is familiar with the difficulty of removing the latter by the unaided influence of constitutional treatment.

Favus, (the *porrigo favosa* of Wilan,) for example, which is one of the most unsightly, as well as the most inveterate of the eruptions of that region, may be temporarily relieved by tonics and fomentations, and the skin even made to appear clean and healthy; but the *virus* still remains, and, consequently, the "cure" will be but of short duration. In this, as in other inveterate diseases of the scalp, of constitutional origin, the skin, from the force of habit, adapts itself to the morbid condition, which it retains, with singular tenacity, against all the usual methods of treatment.

In all these cases, the application of vapour, simple or medicated, as the case may require, to the diseased scalp, will be found a very efficient remedy. Where the object is, to *alter the vitality of the parts*, it can be done more effectually by the repeated application of stimulating vapour (the skin being previously cleansed with any detergent wash) than by the employment of caustic lotions or ointments. Indeed, greasy applications of every kind may be advantageously dispensed with in the treatment of diseases of the scalp.

That variety of baldness, which is the result of atony, or disordered nutrition of the hair-follicles and bulbs, will be materially benefitted by the use of the vapour apparatus.—*Med. Times, Feb.* 16, 1850, *p.* 128.

119.—ON DRESSING WOUNDS AND ULCERS WITH CHARCOAL. By Dr. Newmann.

In 1846 Dr. Newman recommended the employment of charcoal as a substitue for charpie, plasters, ointments, &c.; and since that time numerous cases ("thousands" in all, he says) have confirmed him in the conclusion that the great majority of open surfaces are far more rapidly healed by this means than by any other.

One great object of applications of any sort is the exclusion of the atmospheric air, which coming in contact with the pus decomposes it. The capillary action which takes place between the granules of the charcoal prevents a great accumulation of the pus on the surface of the wound, and spreads it widely, so that it dries and fills up the interstices of the powder, and prevents the access of air to the wounded surface. Charpie and lint also exert capillary action, but not to the same extent, as they cannot penetrate so closely among the irregularities and depressions of the wound. Beside this effect, due to its porosity, charcoal exerts a most favourable influence by its power over putrefaction, and hence its great use in gangrenous wounds, and in fact in all open surfaces when changes in the pus are to be feared. In corroboration of this general eulogium, the author selects certain special cases, which usually offer some diffiulty in their management.

Thus every one knows what a troublesome affection is produced by an *ingrowing nail*, and the painful character of the remedies employed; Dr. Newmann declares he is enabled to heal the obstinate ulcer thus produced in as many days as these various means require months. Having separated the soft parts from the nail, so as to expose the ulcer in its entire depth, he deposits the charcoal freely therein, having combined with it a little acetate of lead, or oxide of zinc, leaving the entire nail covered with this, and binding a piece of lint over it, the patient wearing a wide shoe and keeping quiet. In twenty-four hours the toe is bathed in tepid water, and new charcoal is added to the wound, without disturbing any of that previously applied, which may be firmly adherent. A week or a fortnight of such treatment suffices to heal the wound. *Sore nipples* constitute one of the minor ailments that cause great suffering and trouble in healing. In this case he usually employs lycopodium mixed with a little oxide of zinc (for a fine powder, not charcoal alone, though usually the most preferable one, constitutes the basis of treatment), with which the part is well powdered each time the child has sucked. This penetrates into the fissures of the nipple, and however strongly the child may suck, some of it remains in contact. The wound quickly heals. *Discharges from the ear* dependent upon ulceration of the meatus, are healed by charcoal in three or four weeks, even if the ulcerations were considerable. Tne meatus is syringed out every day, and the charcoal then freely introduced. *Fissure of the rectum* is one of the most painful and distressing diseaseases that come under the cognizance of the surgeon. The charcoal should be applied after every stool, and often in the day besides, care being taken to have it effectually and freely brought in contact with the fissured surface. Dr. Newmann, after expatiating upon the difficulty of treating the suppurating wounds intervening on *extensive burns*, so as to prevent deforming cicatrices, declares that charcoal obviates much of the inconvenience, by keeping the surface of the wound dry, even when the suppuration is abundant; and that contraction does not follow, or it is much less considerable than after any other mode of treatment. If the burn is on the back, charcoal may be freely strewed over the bed. Since he has employed the same means in *gun-shot wounds*, he has met with much less trismus and tetanus, and has been surprised at the rapidity of the cure.

In the treatment of *ulcers of the legs*, even without insisting upon the recumbent posture, he has also been been very successful. In a few days the surface becomes cleaned, and a good crop of granulations developed, while the callous edges are levelled. To diminish the circumference of the sore more rapidly, strips of adhesive plaster are now applied above and below it, and across its middle, the intervals between the strips being strewed with charcoal, covered with ointment spread on lint, and bandaged. This dressing is renewed every two or three days. In this way ulcers, which have continued open for years, have been healed in six or eight weeks, the patient still taking moderate exercise.

The cheapness of the substance, and the ease with which it may be prepared under a variety of circumstances when ordinary dressings are not obtainable, should recommend it strongly, Dr. Newmann observes, to hospital and military authorities. ('Casper's Wochenschrift.')—*Brit. and For. Review, April* 1850, *p.* 546.

120.—ON THE TREATMENT OF NÆVUS.—By Drs. Keber and Lenoir.

Dr. Keber reports upon the great advantage he has found in employing the *strong nitric acid*. The stronger the acid, the less pain does it excite, and the quicker is the recovery. He takes up a drop of the fuming acid with a glass rod, touches the nævus with it, and allows it to dry on. If a small drop be applied at the earliest stage of the nævus, when it does not exceed a pin's head in size, then not even a scar is left; but when the nævus has arrived at a considerable age, the skin around is inflamed by the acid, suppuration is set up, and a cicatrix remains.

M. Lenoir, of the Hòpital Necker, has for some time past treated nævi with great success by means of the *actual cautery*, a means especially applicable when the tumour is so placed as to be attacked with difficulty by the scalpel or ligature. He employs a flat platinum needle, heated to whiteness, and along which a copper globe of an inch in diameter slides at will, for the purpose of retaining a supply of caloric in the blade. He was formerly in the habit of piercing the tumour several times with the needle; but finding this in some cases induce an excess of inflammation, he has since only transversed it once, the sure being thus more slowly accomplished, but at less risk. If at a future period the diminution is not considered satisfactory, recourse may be again had to the needle. After the operation, cold-water dressing or other simple means are employed. ('Medicinische Zeitung,' and 'Gazette des Hôpitaux.')—*Brit. and For. Medico-Chirurg. Review, Jan.* 1850, *p.* 259.

121.—ON THE PREVENTION OF PITTING FROM SMALL-POX, BY MEANS OF MERCURIAL OINTMENT.—By Prof. BENNETT, Edinburgh.

[Dr Bennett gives the two following cases, in which the ung. hydrarg. thickened with starch, as recommended by M. Briquet and others, of Paris, was used with the greatest success. The first patient, a female, 27 years of age, was admitted on the 16th September:

On the 15th, there appeared, on the forehead and face, a papular eruption, which, on the day of admission, had extended itself to the arms, wrists, trunk, and thighs. On examination, I found the eruption partly vesicular on the face, though still papular on the other parts of the body. She complained of sore throat, and difficulty of deglutition. The tongue and throat were red and swollen, and scattered over with bright red points, some of which were already vesicular. The pulse was 90, and strong; tongue furred, but moist; the bowels confined; the urine scanty, with a slight lateritous sediment. She was ordered a *purgative powder; a saline mixture; an astringent gargle; and the following ointment:*—℞. Ung. hydrargyri, ℥j—pulv. amyli, ʒij M., *to be smeared over the face night and morning.* The disease went through its usual course, the eruption was confluent on the neck, arms, and trunk, but discrete on the inferior extremities. The secondary fever was rather severe, but she was discharged cured, November 4.

The ointment formed a thick hard crust, which, as it cracked and peeled off, was renewed by a fresh application. It was observable that she never complained of the face; there was no swelling of the eyelids, and when the whole was allowed gradually to separate from the skin, which was accomplished on the 14 of October, it was perfectly smooth, and of its natural colour.

[The second patient was also a female, 19 years of age, and was admitted on the 27th of November. The eruption had appeared on the face on the 25, and on the 29th the face, mouth, and throat were covered with thickly-set vesicles. On this day]

The mercurial ointment, thickened with starch, was ordered, as in the last case, to be applied to the face—an astringent gargle—Lemonade for drink. By the 5th of December maturation was complete over the whole body, and mucous membrane of mouth and throat. The pustules, in many places, extensively confluent. The pain, however, was diminished, but the bronchitis and sore throat continued; no pain of face or swelling of eyelids, she picks off the plaster from around the mouth. On the 7th, there was some return of the fever; no inconvenience felt in the face; thick scabs adhere to upper extremities and trunk; slight diarrhœa. December 12.—No fever; diarrhœa ceased; appetite returned; a most offensive odour emitted by the body; the scabs have separated from the neck and upper extremities, but are still adherent to trunk and inferior extremities. An abscess formed over the whole surface of each foot below the epidermis. *Soles of the feet to be kept moist with tepid water.* December 17th—The mercurial plaster is now separated from the face, the surface of which is quite smooth. The arms and shoulders are deeply indented with pits, where the scales have separated. The cuticle over the soles of the feet is separating, and a purulent discharge flows from the surface. December 21st—This woman is now convalescent. There are no pits on the face, except round the mouth and that portion of the forehead in contact with the hair, which was not covered by the plaster.—*Monthly Journal, January,* 1850, *p.* 60.

122.—ON THE USE OF TINCTURE OF CAPSICUM FOR CHILBLAINS AND FOR TOOTHACHE.—By Dr. A. TURNBULL.

My plan of treatment is simply to saturate a piece of sponge or flan-
with the concentrated tincture of capsicum, and to rub well over the

seat of the chilblains, until such times as a strong tingling and electrical (!) feeling is produced.

This medicine possesses an extraordinary power in removing congestion by its action upon the nerves and circulation.

This application ought to be continued daily until the disease is removed: relief will be experienced on the very first application, and frequently there will be a total removal of the disease after the second or third. This of course depends upon the severity of the case. This embrocation when rubbed never produces excoriation, if the skin is not broken.

The manner of using it for toothache is by putting a drop or two of the tincture on cotton, and applying it to the part affected, the relief will be immediate. The following is the formula:—Tinctura capsici concentrata. ℞. Capsici baccarum, ℥iv.; spiritus vini rect. ℥xij. Macera per dies septem et cola.

(It may also be made with advantage by displacement.)—*Med. Gazette, Jan.* 25, 1850, *p*. 167.

123.—OPERATION FOR CONTRACTION FROM BURN.—Performed by W. FERGUSSON. Esq., Surgeon to King's College Hospital.

[The object of this operation was]

To take a preliminary step for the removal of the deformity resulting from a burn. The patient, a little girl eight or nine years old, presented, in the right axilla, a cicatriz, forming a kind of web across the arm-pit, which is drawing down the limb towards the chest. This strong web, and various cicatrices about the arm itself, entirely prevent the raising of the limb towards the head, the girl being just able to bring it to a right angle with the trunk. The limb is comparitavely useless owing to this state of things, and it is, of course, of great importance to the child, that this deformity should be remedied. Mr. Fergusson stated, that from the various methods which have been advocated to remove such contractions, he would make choice of one which held out great hopes of radically doing away with the abnormal connexions. It would, indeed, be an easy matter, whilst the patient held out her arm, to divide the band transversely, but by this, the transactions are apt to recur, and parts often return to the same conditions in which they were before. For instance: in congenital union of fingers, the latter will often grow together again when the contracted parts have been freely divided, and the knife does not prevent an ultimate contraction. It has, however, lately been proposed, that a callus should be excited at the upper part of the band, and that the latter should be divided only when the superior portion is sufficiently hardened to preclude the possibility of its taking on adhesive action. Mr. Fergusson, after having given this explanation, thrust a curved needle, armed with a skein of silk thread, through the base of the above-mentioned web, very close to apex of the cone formed by the axilla; this seton is expected to excite a sufficient inflammation and subsequent induration in the part, and, when this has taken place, the band may with safety be divided. Mr. Fergusson mentioned, that this process is rather tedious, and that it would be much more expeditious to cut at once through the contracted parts, but the benefits resulting from the course he had adopted were well worth the time necessary for the different steps of this method of remedying deformities from burns. Mr. Fergusson had lately a message from Chelius, the celebrated surgeon of Heidelberg, concerning this mode of operating; and continental surgeons are in the habit of thus endeavouring to forestall fresh contractions, when those resulting from burns have been divided.—*Lancet. Feb*. 16, 1850, *p*. 217.

SYPHILITIC DISEASES.

234.—ON THE GENERAL TREATMENT OF SYPHILIS—By BRANSBY B. COOPER, Esq., F. R. S., Lecturer on Surgery at Guy's Hospital.

[Mr. Cooper remarks that the difficulties in the the treatment of syphilis arise chiefly from the peculiarities in the constitutions of patients; and that therefore it is impossible to lay down any general rule, further than that mercury is to be administered, modified and combined with the other remedies appropriate to the case. He says:]

In primary syphilitic sores, if they be only of three or four days standing, I at once apply concentrated nitric acid, which has always proved sufficient to destroy the virus, and I have in no instance known secondary symptoms to follow this treatment. If the sores be of longer standing, and, both from the history of the case and their appearance, there be just reason to suspect a syphilitic origin, I at once commence with blue pill night and morning, abstaining, as I have already mentioned, from any local aplication, taking the appearence of the sore as the indication of the effect of the mercury upon the constitution; again, in sores which, from their appearance and the history of the case, are of doubtful character, I employ constitutional and local means, as indicated by the peculiar temperament and diathesis of the patient, as well as by the conditions of the sore itself. In such cases I prescribe iodide of potassium, bark, with nitro-muriatic acid, sarsaparilla, and similar remedies, applying merely warm water dressing to the sore; and if such means do not prove effectual, I then resort to small alternate doses of mercury, placing the patient at the same time under strict dietetic discipline.

With all these precautions, however, it sometimes happens, that, although the primary sores may yield to the treatment adopted, secondary symptoms will result; in my own experience I should say that this untoward event occurs either in consequence of the mercury having been discontinued before the induration of the sore had entirely disappeared. or or from some peculiarity in the constitution which prevented the specific effect of the mercury upon the disease.

There is sufficient reason to suspect the existence of this latter condition when the virulent ulcer remains unchanged in its appearance after mercury has been exhibited for the period usually sufficient to produce its effects; and at the same time, when no ptyalism is present in these cases, I leave off the use of mercury internally, and make the patient rub in mercurial ointment, which rarely fails to produce the desired effect; but even in this case the mercury must be continued until all induration of the sore has vanished.

Secondary symptoms.—If we fail from any cause in eradicating the specific virus of a primary sore, although at the same time we may have succeeded in producing its cicatrization, constitutional symptoms supervene, and what are termed "secondary symptoms" are established: these may be the result of primary chancre in the individual affected, or they may be hereditarily communicated from the mother to the infant, although it may also happen that the infant might be at birth inoculated by a chancre in the vagina of the mother, and secondary symptoms ultimately result from that contamination.

Secondary symptoms, when they take place from uncured primary affections, in consequence of the admixture of the virus with the blood, do not, as Hunter has said, seem to produce a general constitutional effect, for during the influence of the poison every vital function seems to be perfectly performed; but owing to the susceptibility of certain parts to be affected by the venereal poison, a train of local symptoms present themselves: thus, the mucous membrane of the throat and tonsils, the skin, mucous membrane of the mouth and nose, and the iris, seem to be successively affected. It has been said that there is a second order of parts liable to be consecutively affected,—as the periosteum and fibrous tissues generally, even the bones themselves,—but I am inclined to believe that such affections depend upon the action of mercury in peculiar constitutions, especially in those of a rheumatic or gouty diathesis Under ordinary circumstances the parts which seem especially prone to be affected by this form of syphilitic disease are mucous membranes and skin; and, as far as I have seen, the sore-throat generally precedes the cutaneous eruptions. From about six weeks to two months, and even sometimes longer, after the primary symptoms appear to have been cured, the patient generally begins to complain of an uneasy sensation in swallowing, attended with more or less dryness about the fauces. Upon examination an erythematous blush will be seen extending over the mucous membrane of the soft palate and tonsils, but which can scarcely be distinguished from the inflammation concomitant with simple sore-throat; unless, perhaps, it may be said that the mucous membrane has somewhat the appearance of being raised from its adjacent tissues, and that it is less vivid in colour than in common inflammation, and this is unattended by enlargement of the tonsils themselves.

When I see these symptoms I at once examine the cicatrix of the primary sore, and also the chest and abdomen, to ascertain if there be any venereal blotches: if I find any thing approaching to an abnormal induration in the cicatrix, I order mercury, and if the patient had taken it internally before, I usually direct him to rub in mercurial ointment, taking it for granted that the secondary symptoms indicate the failure of the mercury, before taken internally, in destroying the specific syphilitic poison; but if there be no such induration of the cicatrix nor venereal blotches, and if I learn from the history given by the patient that there was reason to believe that the mercurial course had been judiciously attended to, I prescribe the following mixture:—℞. Iodini, gr. ss.; potass. iodid. ʒss.; papav. syrup. ℥ss.; inf. gentian. co. ℥viij. M. capiat cochl. larga, ij. bis quotid.

Should I have any doubt of the accuracy of the patient's account of his case, I prescribe, in addition to the above mixture, three grains of Plummer's pill at bed time.

If the erythematous blush still continue, it will soon begin to ulcerate, generally beginning on one of the tonsils, and sometimes in the velum palati or uvula: in such cases I first prescribe the mixture as above, and if the sores then heal, but if the patient be of delicate constitution, I give him bark, with nitro-muriatic acid, to improve his general condition; and should the symptoms of sore throat again return, I order Donovan's solution, as follows:—℞. Sol. iodid. hydrarg. et arsenici, ♏v.; sarsæ ext. gr. x.; sarsæ decoct. co. ℥jss. M. ft. haustus bis quotid. sumendus.

This remedy I have found of the greatest use, and in these cases it far surpasses, in my opinion, the iodide of potassium, which seems to suspend the diseased action for the time rather than to remove it from the system.

The erythematous syphilitic condition of the throat, which I have just described, sometimes passes into a chronic form, and then seems especially to attack the mucous membrane covering the middle constrictor of the pharynx: the true erythematous blush can scarcely be recognized, but the membrane puts on a streaky white appearance, and the patient complains more of an uneasy dryness of the throat than of pain in swallowing: if this condition be not removed, cutaneous eruptions are almost sure to follow. I give, therefore, Donovan's solution in these cases, and not unfrequently paint (with a camel-hair brush), the affected mucous surface, with the solution of nitrate of silver.

I have sometimes known patients thus affected become quite deaf, without any enlargement of the tonsils, which leads me to believe that the inflammation sometimes extends along the eustachian tube. In some few cases I have found it extremely difficult to cure ulcerations of the throat resulting from secondary symptoms; and in these, the remedies I have described seem almost inefficient. This occurs more especially when ulceration extends to the mucous membrane of the larynx, and probably the difficulty arises from the continuous motion of that organ, which interrupts nature's efforts at reparation. I have found the fumes of the red oxide of mercury, inhaled by means of an appropriate apparatus, very effective in these cases; and I believe, should this not have the desired effect, nothing is left to be done but to perform the operation of tracheotomy, with the object of placing the inflamed and ulcerated mucous membrane in a condition in which it can remain in a perfect state of rest; as unless the ulceration is checked, the death of the patient must inevitably take place.

I acknowledge that I have never myself performed the operation of tracheotomy with this view, but I once advised its adoption in the case of a gentleman of Woolwich: he would not, however, consent to its being performed, and died six weeks after from the continued progress of the disease.—*Med. Gazette, Jan.* 11, 1850, *p.* 46.

125.—ON THE PATHOLOGY AND TREATMENT OF CHANCRE.—By BRANSBY B. COOPER, Esq., F. R. S.

In my own practice I have come to something like the belief that induration, approaching to cartilaginous hardness at the base of a sore, is almost always the indication of its virulent nature, and demands, therefore, the specific action of mercury for its cure, or secondary symptoms will be certain to supervene. If the patient should present himself to the surgeon within three or four days after the sore has appeared, I agree with Ricord in the belief that the application of nitric acid will entirely destroy the virus, and that the sore will heal, and not leave the patient subject to secondary symptoms. I have in several cases followed this practice, and without the occurrence of secondary symptoms in a single instance. I should, however, never recommend the adoption of this plan when the base of the sore has become indurated. The success of this "abortive treatment," as it is termed by Ricord, proves that a period exists in which the action of venereal contagion after infection is entirely local. Some authors speak of this as the period of incubation, but I can scarcely comprehend what is here meant by incubation. Pus cannot be formed instantaneously; there must be premonitary symptoms. So also in the development of disease from the action of a virus; and, therefore, it must be considered that at first there is merely a local action, perhaps merely simple irritation; and secondly, the specific action is generated. It is during the first epoch that means may be employed to destroy the virus before the constitution is affected, the hardness of the sore being, in my opinion, an indication of the constitutional specific action having commenced.

As may be inferred from what I have already said, syphilis may not only be propagated by sexual intercourse, but also by inoculation, which may take place by accident; for example, a lancet may be employed in bleeding a patient after having been used to open a virulent bubo; and again, infants are not unfrequently inoculated with the primary disease during their birth, from the presence of a chancre in the vagina of the mother. The period which elapses between the time of infection and that at which the disorder becomes manifest, varies from seven to ten days, but is sometimes considerably longer. The first local symptom is an inflamed reddish spot on the part infected. From this inflamed patch a vesicle arises, containing a small quantity of fluid. When the vesicle bursts ulceration is set up, and the part begins to thicken and to be elevated above the surrounding structures, the thickening being generally circumscribed, having an indurated base and prominent edges. The ulcer sometimes continues to extend itself, and assumes a phagedenic character. It may also acquire a hard everted edge. The usual form of a chancre is more or less circular, but this characteristic depends in a great measure upon the situation of the sore, and the firmness of the attachment of the mucous membrane to the subjacent tissues. Hence a chancre extending from the glans to the mucous membrane of the prepuce exhibits great irregularity of form, in consequence of the unequal attachment of the mucous membrane to the interior of the prepuce and the surface of the glans.

Another great source of irregularity in the form of the chancre is the extension of the ulcerative process from one ulcer to another, uniting them into one irregular sore. The depth of a chancre is greater when the sore is situated on the prepuce than when on the glans, which latter structure seems to have a great power to modify the appearance of the sore, and from its higher degree of vitality seems to resist the progress of the ulceration into its structure, and the sore therefore extends itself chiefly superficially. The surface of a chancre usually assumes a greyish appeance, looking as if besmeared with a secretion of that color, having a degree of tenacity as if composed of semi-organized matter, and somewhat resembling the kind of secretion seen on cancerous sores. An eschar often covers a chancre, particularly if it be exposed to the action of the air; and from under this crust matter not unfrequently exudes; this matter is usually virulent. An areola of inflammation surrounds the sore, terminating usually by that hardness which constitutes the base; and the color of the areola depends much upon the canstitution of the patient. The edges of the chancre are generally everted, and, as I have before said, becomes indurated like the base. All these physical peculiarities, if present, would render the diagnosis of true syphilis sufficiently evident: but as the sores present all the various modifications already described, owing to differing constitutional conditions, it is but rarely that they present themselves in such a form as to enable the surgeon to arrive at once at a correct opinion. This involves a question, whether it be right to submit a patient to the ordeal recommended by Ricord, viz., inoculation? In my own practice I have frequently found great difficulty when employing his method, in healing the factitious sore; and I am inclined to believe that even the constitutional symptoms are aggravated by thus adding a fresh taint through the medium of inoculation. I know that Ricord is of opinion that the quantity of matter introduced is of no importance as to the effect upon the constitution; in this respect I must, however, maintain an opposite opinion, which is, indeed, founded upon my own experience and observation of the disease.

Primary syphilitic sores in women are formed on the labia and nymphæ, just as they are upon the glans penis in man; and they go on to ulceration in exactly the same manner. Chancres are also often formed on the perineum, and even on the verge of the anus, in the female; for the purulent matter may run down from the genitals, and, excoriating the parts, produce ulcers upon them.

If a patient applies to me with a venereal sore which had only made its appearance three or four days before, I at once apply concentrated nitric acid, for the purpose of destroying the virus before it has affected the constitution; nor have I hitherto known a single case so treated in which secondary symptoms supervened. Some surgeons always recommend local means for the cure of a chancre, at whatever period it may be presented to the view, arguing, that if secondary symptoms do supervene, they are as readily cured as the primary. It is also considered by many that secondary symptoms may be cured without the use of mercury.

I cannot say that I hold to either of these opinions, but believe firmly, that if secondary symptoms result, either from failure in the action of the applied cautery, whatever that may be, or from the unsuccessful issue of any other plan of treatment, that nothing but mercury can be relied upon as a true specific; but the mode of its exhibition, and quantity administered, must of course depend upon the state of the constitution of the patient.—

The plan of treatment which I adopt, I vary according to the appearance of the sore: if it exhibits all the indications I have described as the signs of a true chancre, I begin by treating the patient constitutionally. I give five grains of blue pill and a quarter of a grain of opium every night and morning, without applying any local remedy whatever. My reason for this is, that I consider the appearance of the chancre the best indication of the effect the medicines produce. Some years ago it was very much the practice to severely salivate syphilitic patients; but I may say that this custom among surgeons has now passed away, and mercury is seldom given in greater quantity than is sufficient to slightly affect the gums and salivary apparatus. The quantity of mercury required varies, moreover, in every case, as different constitutions are so variously affected by this medicine.

It appears to me much better to allow the chancre to remain without local treatment during the time the patient remains under the influence of the mercury; for as the surface of the sore is covered with a peculiar brownish matter, and it goes on gradually extending, and eating its way deeper and deeper into the structure in which it is formed, if black wash or nitrate of silver be applied, the chancre loses at once its specific appearance, and consequently we are deprived of a valuable guide by which we may estimate the amount of constitutional effect produced by the mercury. I have long followed this plan of treatment, and with sufficient success to confirm me in my adherence to it.—*Med. Gazette, Dec.* 21, 1849, *p.* 1046.

126.—ON IRRITABLE CHANCRES.—By Bransby B. Cooper, Esq.

This form of syphilitic sore is indicated by great sensitiveness to the touch, tendency to bleed, and by glassy and exuberant granulations, the whole sore being surrounded by an inflamed areola. Opium is the best remedy to be employed in these cases, but it must be given in repeated doses: at the same time, the nitrate of silver should be applied to the surface of the sore. If, after this treatment, the irritability be subdued, but the peculiar induration of a syphilitic sore still remain, mercury must be administered, in the same manner as in a case in which the irritable condition had never existed. In some instances of irritable chancres, where I have combined calomel with the opium, for the purpose of preventing the constipating effect of the narcotic, I have found this combination not only equally efficacious with the opium alone in curing the irritability, but at the same time it cures the syphilitic character of the sore, and have even found its continuance, after the irritable symptoms had been relieved, sufficient to complete the removal of the syphilitic character also. This plan cannot, however, always be adopted, as certain constitutions are so extremely susceptible to the purgative influence of calomel.—*Med. Gazette, Jan.* 11, 1850, *p.* 45.

127.—ON PHAGEDENIC CHANCRES.—By Bransby B. Cooper, Esq.

This is closely related to the kind of chancre I have just described; but instead of being characterised by extreme sensitiveness of surface, it is marked by the rapidity with which it ulcerates; so that the increase of the sore surface is the source of action in such cases. Having first well opened the bowels, to make sure that there is no accumulation of fæces in the intestinal canal, repeated doses of opium are to be given, and soothing fomentation applied to the sore. Should the vital powers of the patient be depressed, bark, ammonia, and even a little wine may be safely and judiciously prescribed; but if, on the contrary, the condition of the sore is at all referable to a plethoric state of the system, antiphlogistic means must be adopted; and, should not such constitutional treatment prove effective in checking the progress of the ulceration, I am in the habit of applying concentrated nitric acid, which I have rarely found to fail in these cases. I lately attended a case with Mr. Parrot. jun., of Clapham, who had carried the use of sedatives and tonics to the fullest extent, paying due attention at the same time to the state of the bowels, without being able, however, to check the progress of the disease. One application of nitric acid by the point of a glass rod proved sufficient to check the ulceration; and, under the subsequent exhibition of mercury, the patient recovered.—*Med. Gazette, Jan.* 11, 1850, *p.* 45.

128.—ON GANGRENOUS CHANCRES.—By Bransby B. Cooper, Esq.

This form of chancre is to be treated much in the same manner as any other gangrenous sore, depending as it does more frequently upon constitutional than upon local causes. The first object should be to secure the free evacuation of the bowels; stimulating poultices should be applied immediately on the sore, such as black wash, nitric acid lotion, or stale beer grounds, the patient being kept in the recumbent posture. Ammonia, bark, or serpentary, with wine or porter, are usually indicated; although in some few cases I have met with gangrenous chancres in persons of such a temperament as to preclude the propriety of the exhibition of stimuli, and which have, indeed, required sudorifics and opiates, uncombined with the latter class of medicines.—*Med. Gazette*, *Jan.* 11, 1850, *p.* 45.

129.—ON BUBO.—By Bransby B. Cooper, Esq.

[Mr. Cooper lays especial stress upon the importance of distinguishing between a bubo arising from a virulent and one from a non-virulent disease. He says:]

Non-virulent bubo is that which attends simple gonorrhœa, and may be considered as arising from common inflammatory action, extending in the course of the absorbent vessels of the penis to the glands of the groin; this disorder is to be treated as phlegmonous swellings in other parts of the body, either by repellants for the purpose of preventing the formation of matter, or by fomentations or poultices to produce suppuration, when that termination seems to be threatened by nature.

By repellant remedies, I mean those which have a tendency to repress the formation of matter, such as leeches and evaporating lotions; by means of these we may succeed in preventing suppuration, but there sometimes yet remains a permanet indurated condition of the swelling, which may excite apprehension in the mind of the surgeon as to its having been produced by a specific virus, a chancre existing within the urethra. A bubo of this kind may, however, result from a mere strumous habit; and if so, the hardness readily yields to the exhibition of iodine and iodide of potassium, and such dietetic rules as generally improve strumous constitutions; while, on the contrary, if the hardness depends upon the action of a specific poison, a mercurial course is, in my opinion, the only safe mode of treatment.

A *virulent bubo* is marked by the same characteristic induration as a chancre itself, and the presence of this induration must inevitably give rise to the question of the virulent or non-virulent nature of the disease. The mere phlegmonous bubo has always a tendency to suppurate; while the virulent bubo, on the contrary, seldom manifests this disposition; and, therefore, its permanent hardness, uncombined with any symptom of suppuration, is a further proof of a virus having been the origin of a bubo. The virulent bubo goes on to ulceration; but even this is not conclusive, for strumous ulceration not unfrequently occurs in persons of a scrofulous diathesis; therefore, as Ricord observes, there is as much difficulty in forming a diagnosis between the virulent and non-virulent bubo as between the virulent and non-virulent sore; and he maintains that by inoculation, and by that test alone, can a certain conclusion be arrived at.

The same objections arise here as I have before described when speaking of doubtful sore—viz., the difficulty of healing the factitious sore; nor, indeed, does it always occur, as Ricord himself acknowledges, that the sore produced by a virus invariably puts on the decided character of a virulent ulcer; so that, indeed, the same difficulties may still result in forming a just diagnosis as existed before the experiment was tried.

In my own practice, therefore, when the bubo puts on all the characters of a virulent or specific action, I commence at once with the cautious administration of mercury, not unfrequently combining with it small doses of iodide of potassium, abstaining at the same time from the use of any local application to the ulcerated bubo, which might tend to conceal the characteristic appearances of the sore. If the mercury be producing the desired effect, the ulcerated surface of the swelling acquires a healthy appearance, indicated by the growth of soft red granulations, by the absence of any tendency to eversion of the edges of the sore, and by a general softness of the whole base of the tumour; indeed, the characteristics of the healing sore are as strongly marked as were the peculiarities which had before indicated its virulence. The murcury should be continued as perseveringly, until all induration has disappeared, as in the cure of a primary chancre, or secondary symptoms will be sure to supervene.—*Medical Gazette, Jan.* 11, 1850, *p.* 46.

130.—ON VENEREAL WARTS AND CONDYLOMATA.—By Bransby B. Cooper, Esq.

In long standing cases of gonorrhœa you will sometimes observe condylomatous growths about the scrotum, perineum, and verge of the anus; these can generally be cured by an application of the yellow wash. Warts often follow also upon a gonorrhœa, in cases where the disease commences externally—that is to say, in balanitis. In the first instance they are found in points where the mucous membrane has been abraded; warty granulations spring up from these points. Whenever these warts are present with phymosis, the prepuce must be laid open immediately; this is always necessary. Sometimes these warts are very difficult to cure. When they have narrow peduncular necks, a ligature may be used to remove them; in other cases caustic should be applied to them, and savine powder may also be employed as an escharotic. Sometimes, however, neither caustic nor savine powder will remove these warty excrescences; they must then be excised, and caustic applied to the surface from which they are removed.—*Med. Gazette, Dec.* 7, 1849, *p.* 959.

131.—ON GONORRHŒA.—By Bransby B. Cooper, Esq.

Whatever may be the cause of a gonorrhœa, it is impossible to distinguish between that produced by sexual intercourse and that having some other origin; and whatever may be the opinion entertained as to the identity or otherwise of this affection with syphilis, one thing is certain, it is a disease of a highly inflammatory nature; this would seem to regulate in a great measure the system of treatment to be adopted for its cure. The means of treatment are of two kinds, internal remedies and topical applications; in the acute stage antiphlogistic measures must be adopted; and in the army, where we had a tolerable amount of practice in this way, we used to cure almost all our cases in ten or twelve days. The system we always adopted was to put the patient to bed, and give tartar emetic, so as to keep him in a constant state of nausea; the discharge, which was thick and pus-like, then became thin, and the chordee and priapism, which were so distressing to the patient, ceased almost immediately; in some cases leeches were applied to the perineum; occasionally blood was taken from the arm; and, having subdued the inflammatory symptoms, as an internal remedy we gave the balsam of copaiba. In private practice we cannot, however, get patients to submit to quite such stringent measures; but at the same time I think you should always be somewhat active in your antiphlogistic treatment. After giving purgatives and nauseating doses of tartarized antimony to subdue the inflammation, I have found the following mixture very efficacious:—℞. Balsam copaiba, ℥ss.; pulv. cubebæ, ℥ss.; liq. potass., ʒjss.; mucilag. gum. acaciæ, ℥ss.; aquæ distillatæ, ℥vijss. M. ℥j. bis in die sumenda. This mixture should never be taken upon an empty stomach; about eleven and three o'clock, are, I think, the best times; the mixture alone will remove all the violent symptoms, and stop the discharge, but unless previous lowering treatment has been adopted, the discharge will return; if, however, purgatives and tartar emetic have been given beforehand, the above mixture will almost always effect the cure. My own practice is to give the mixture first, to alleviate the distressing symptoms; I then employ antiphlogistic treatment, and afterwards recur to the mixture to complete the cure.—*Med. Gazette, Nov.* 23, 1849, *p.* 871.

132.—ON THE USE OF INJECTIONS IN GONORRHŒA.—By Bransby B. Cooper, Esq.

Sedative injections will probably always be of service when the inflammation is considerable, as they almost immediately give relief to the pain. Liquor plumbi diacetatis, ♏xx.; and water, ℥jss., is a very good sedative injection. When thrown into the urethra it should be kept in for some time by compressing the end of the penis. When the inflammation is very severe, emollient injections may also be useful, as they impart to the internal surface of the urethra a protective coating against the irritative effect of the urine. Irritating injections must not be employed where there is much inflammation, particularly when there is any constitutional tendency to irritability, nor when the inflammation has extended to the testicles or bladder, which is known by the tenderness of the parts, and a constant inclination to make water: they should also be avoided when there is a probability that the perineum will suppurate. Irritative injections often produce a good effect in constitutions that are not very irritable, and where the disease appears under a mild form. A grain of bichloride of mercury, in eight ounces of distilled water, is a good injection of this kind; its strength may be somewhat increased as the treatment goes on, if it should not at first be found effectual.—*Med. Gazette, Dec.* 7, 1849, *p.* 958.

DISEASES OF THE EYE AND EAR.

133.—NEW INSTRUMENT FOR THE EXAMINATION OF THE EAR.

Mr. Harvey exhibited an instrument to the Medical Society of London for the purpose of testing the condition of the eustachian passages. The instrument, which was a modification of Kramer's auriscope, had been used in a great number of cases by Mr. Harvey, and the result of that experience had been his conviction that catheterism of the tube was most frequently resorted to where no such necessity existed. The instrument resembled a flexible stethoscope, but the bell-end was sufficiently large to cover the auricle of the patient; the other end of the instrument was tube-shaped, and this being placed in the ear of the surgeon, the condition of the ic inflammation, and sometimes is so much hypertrophied, that its inner surface is in contact with the promontory. In acute inflammation, lymph is effused from this mucous layer, and bands of adhesion are formed which connect it to the ossicula, or to the inner wall of the tympanum. The diseases of the membrana tympani, in which all its component structures are at the same time affected, are the following:—1. Hypertrophy, where the epidermoid, fibrous, and mucous layers are thickened. This not unfrequently proceeds to so great an extent, that the membrana tympani is ten or even twenty times its natural thickness, and it becomes opaque, hard and dense, like a piece of cartilage.—2. Ulceration, where all the layers are destroyed, wholly, or only in one part, so as to cause a perforation.—3. An increase of the external concavity, so that its internal surface is in contact with the promontory with which it is frequently firmly adherent.—4. An absence of the external concavity, in place of which it is perfectly flat.—5. Scrofulous degeneration, in which all the layers lose their natural structure. 6. Calcareous degeneration, in which there is often not a vestige of healthy structure in any of the layers.—7. An increased degree of teneseness; this state is most frequently accompanied by the presence of membranous bands, which connect its inner surface to the promontory stapes, or other parts of the inner wall of the tympanum.—8. Sometimes the whole of both fibrous coats are destroyed by ulceration, and the mucous layer remaining entire, falls inwards, and covers the surface of the promontory, and the inner wall of the tympanum.—9. Sometimes one-half of the membrana tympani is destroyed, and the border of the remaining half becomes adherent to the inner wall of the tympanum, forming a closed cavity.—10. The entire substance of the membrana tympani is sometimes ruptured. The part most subject to rupture is that between the posterior margin and the handle of the malleus.—*Lancet, April* 13, 1850, *p.* 455.

137.—THE ARCUS SENILIS A FATTY DEGENERATION.

At a recent meeting of the Westminster Medical Society, Mr. **Canton** displayed some sections of the cornea, under the microscope, taken from a female, aged 82 years, with a view of showing the arcus senilis to be a fatty degeneration of the cornea. In the same subject, (a spare woman, who had died apparently of old age), the heart and arteries were affected with the like atrophy with degeneration, as it has been termed by Professor Paget. Several other specimens made from the corneæ of persons who had passed the age of fifty, showed the deposit between the fibres of the part. Mr. Canton stated that he had not as yet met with the appearance of a corresponding deposit in the edge of the crystalline lens, as had been mentioned by Dr. Schon, of Hamburgh. A clear internal ring of cornea is always to be seen between the edge of the senile zone and the margin of the sclerotic.—*Prov. Jour. March* 20, 1850, *p.* 161.

MIDWIFERY,

AND

THE DISEASES OF WOMEN.

138.—ON THE DETECTION AND TREATMENT OF INTRA-UTERINE POLYPI. By Prof. SIMPSON, Edinburgh.

[Dr. Simpson commences his interesting paper by quotations from Ramsbotham, Madame Boivin, Dupuytren, and others, to show that the existence of polypi entirely within the uterus and concealed by it, cannot be certainly determined by the symptoms to which they give rise. It has been supposed, he remarks, that this uncertainty was of little practical consequence, since hemorrhage,—the great source of danger in uterine phlypi,—was not liable to occur until the polypus had passed the os uteri. But Dr. Simpson saw with Dr. Wood, a few years ago, a case which shows that this opinion is not true. It was the following:]

Case I.—The patient was about fifty-five years of age, and unmarried. She had been suffering long under severe menorrhagia. The face was pale and anemic, and her health and strength broken down. On examining her vaginam, the os uteri was found closed; but the uterus felt somewhat large and distended; and Dr. Wood believing, with me, that the hemorrhage drain which was present might be the result of an intra-uterine polypus, the mechanical dilatation of the uterine cavity was advised; but given up, in consequence of local treatment being objected to. In a few weeks the patient sunk under the continued hemorrhage. On opening the body, Dr. Wood and I found the lower part of the cavity of the uterus distended by a polypus, of the size of a small plum, and attached to the back wall of the uterus by a narrow half-broken stalk. The lining membrane of the uterus was white and bloodless; but the polypus was red, from engorgement and effusion of blood in its tissues. Its structure was fibrous; and there was another small fibrous tumour embedded in the walls of the uterus, near the uterine extremity of the right Fallopian tube. It had descended lower down than at the time we examined, so as to have already dilated the cavity of the cervix; and the os, at the time of death, had begun to open. It was evident that, if the cavity of the os and cervix could have been artificially dilated during life, the polypus would have come within reach, and the patient's life been saved.

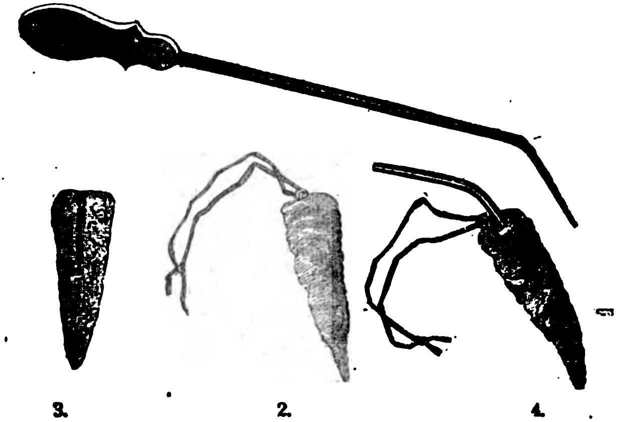
When nature, in cases of intra-uterine polypi, begins to expel the tumour, and open up the os uteri, we may at that stage, find it possible to make a diagnosis of the disease, by being able to "*feel* the rounded tumour within." If art could furnish us with any means of producing, at will, the same extent of opening of the os uteri, it would enable us in the same way to "*feel* the rounded tumour within" with our finger; and it is evident that, by this means, we should possess a power of detecting, with all the certainty of a physical diagnosis, the existence or not of the disease within the cavity of the uterus, in cases in which the attenant rational symptoms—as the menorrhagia, uterine leucorrhœa, and perhaps the swelled state of the neck or body of the uterus—might lead us to conjecture the probable presence of an intra-uterine polypus.

In 1844, in a communication laid before the Medico-Chirurgical Society of Edinburgh, I proposed a means of safely opening up the cavity of the cervix and body of the uterus, to such an extent as might enable us to introduce a finger into the uterine cavity, for the purpose of diagnosis and operation in this and other diseased states of the organ. The means described consisted in the introduction of sponge-tents into the os and cavity of the uterus, so as gradually to dilate these parts to the degree required. For several years past I have been constantly employing this means of dilatation of the uterine os and cavity, and for a variety of purposes and indications. The sponge-tents used by myself and my professional brethren in Edinburgh, are manufactured by Duncan, Flockhart, & Co. They are of a narrow conical or pyramidal form; and used of many different sizes and lengths, according to the object in view. These tents are made by dipping a piece of sponge in a strong solution of gum-arabic—tying and compressing this sponge around a central wire, as its axis, into the required conical form, by a continuous layer of whip-cord, drying it thoroughly, removing the cord, and subsequently slightly coating the surface of the the tent with tallow, or axunge and wax, to facilitate its introduction. The central wire passes only for half-an-inch or an inch into the base of the cone (see section of one in Fig. 3); and the opening left by it serves as an aperture to transfix the tent with the tip of the metalic director (Figs. 1 and 4), used for guiding and introducing the tents through the os uteri. They are introduced like the uterine sound or the catheter; the handle of the metalic director, with the sponge affixed to it, is held and manipulated by the left hand, while the fore-finger of the right hand touches the os uteri, in order to guide and direct the apex of the tent into that opening. The old forms of sponge-tents used by surgeons, and made of sponge steeped in preparations of wax, required for their expansion and development the aid of heat, in order to dissolve their retaining ingredient. The tent I have described, made by steeping sponge in a solution of gum, requires moisture, and not heat, for the solution of its retaining material, and for the expansion of the sponge. Very generally the secretions of the surrounding mucous canal afford a sufficient quantity of moisture for these two purposes; but if not, a small quantity of tepid water may be injected from time to time into the vagina. Usually a well-made tent takes twenty or thirty hours to expand to its full extent in the os uteri; and dilates to four or five times the diameter it presented in its original compressed state. Generally the first tent opens up the os and cavity of the cervix, and allows the finger ample space to examine sufficiently its contents, and the state of its parietes.

If it is necessary to open the uterine cavity higher, to enable the finger to pass into the cavity of the body of the organ, a succession of tents are usually required; and they must be passed completely through the os internum or narrow portion, lying between the cavity of the cervix and cavity of the body of the organ. The use of the tent for a day generally, as I have already stated, dilates the os, uteri and cavity of the cervix sufficiently; and the employment of the sponge is accompanied with little or no feeling of uneasiness. When it is necessary to examine the state and conditions of the interior of the cavity of the body of the organ, the persevering use of a series of larger and larger tents for several days is usually requisite; and the dilatation of the os internum and body of the organ sometimes, but not always, causes a feeling of uneasiness and pain, that may require the use of an opiate. I have omitted to state that the tent is always prepared with a string affixed to its base, to allow of its easy removal.—(See Fig. 2.) In using sponge tents, it should be remembered that, when sponge is in contact with the maternal passages for some hours, it always exhales, when removed, a very fœtid odour.

For dilatation of the unimpregnated os uteri, the tent should be selected as regularly conical as possible, and with the apex neither too blunt and rounded to pass the os, nor too slender and flexible so as to double back in the attempt. The spirally grooved surface of the tent, resulting from the compression of it by the whip-cord during its manufacture, tends to retain it *in situ*, till its expansion commences. It, perhaps, ought to be added, that the introduction of the sponge-tent into the os and cavity of the uterus, should be effected without the use of the speculum. The sense of touch serves, in this and some other analogous operations, infinitely better than the sense of sight.

FIG. 1.



The wood-cut represents sponge-tents, and the instrument for introducing them.

Fig. 1 represents the strong metallic handle or director employed for the introduction of the tents At the distance of nearly two inches from its point, it is bent at an obtuse angle. From this angle the instrument is made to taper to a blunt point.

Fig. 2 represents a sponge tent with the string for its extraction attached to its base.

Fig. 3 shows a section of the tent with the linear cavity in its base intended to receive the point of the metallic director, as is represented in Fig. 4.

By the use of sponge-tents introduced daily, and of increasing size and length, we may reach a polypus when affixed and sessile even upon the fundus uteri. One of the first cases in which I dilated the uterine cavity to its extreme height, was the following :—

Case II.—In 1844, a patient æt. thirty-six, under the care of Dr. Graham of Dalkeith, had a miscarriage from the effects of which she never satisfactorily recovered. Previously she had borne four children. When first I saw her, two or three years afterwards, she was emanciated and extremely pallid from the excessive loss of blood which she had been sustaining for some time; and her weakness was such, that it was with difficulty she could rise and walk across her beb-room. In August 1847, I dilated fully the interior of the cervix and body of the uterus by a succession of sponge-tents, and at last felt a hard round fibrous polypus seated at the very fundus of the uterus, and projecting, of the size of a walnut, into the upper part of the cavity of the organ. Dr. Ziegler, Dr. Toogood of Torquay, and other professional friends, confirmed this diagnosis. It was impossible to ascertain how it was pediculated, or to operate upon the pedicle. We could only reach the round body of the tumour; and that I compressed strongly and repeatedly in the blades of a lithotomy forceps, with the view of breaking down its tissue, so as to destroy the vitality of the polypus. A purulent discharge followed, and three largish pieces of organised structure were subsequently cast off. Her recovery of health, after these discharges ceased, was gradual but perfect. There has been no return of menorrhagia. About a year ago she called upon me, and the change from excessive pallor and emanciation of the face, to the hue and ruddiness of health was so great, that I had difficulty in being convinced of the identity of my former patient.

The *symptoms* which might, *a priori*, induce a practitioner to conjecture the probable existence of an intra-uterine polypus, are of a very uncertain and equivocal character. The polypus, while still included within the uterus, is principally liable to give rise to the following groups of symptoms:—

1st. Menorrhagia, in consequence of the discharge of blood from the surface of the tumour. The attendant hemorrhages take place particularly at the menstrual periods, but are apt to recur also at other times; and the blood is sometimes fluid; sometimes coagulated; occasionally there is an almost constant red stained discharge. The effects of these repeated floodings upon the constitution of the patient vary with their amount; but if they go on increasing (as they usually do) in quantity and frequency, the patient's constitution becomes gradually more and more shattered and broken down by the amount of hemorrhagic discharge; and all the symptoms of anemia in their most marked degree at last supervene, as pallor of the face and lips, great muscular debility, palpitation, vertigo, dyspepsia, œdema, &c.

2dly. The discharge of mucous, purulent, or serous matter from the cavity of the uterus, in consequence of the mucous membrane of the organ becoming often irritated, inflamed, and even ulcerated by the presence and pressure of the polypus. If a severe leucorrheal discharge is present, and we ascertain by the speculum that it does *not* originate in ulceration or other morbid state of the external surface of the cervix, or of the vagina; and if we further detect, with the speculum, the discharge issuing from the cavity itself of the uterus, the probabilities of it originating in some pathological irritation within the uterus, will be necessarily increased. Sometimes the discharge, in cases of polypi, is fœtid, especially if it be retained, or mixed with decomposing blood.

3dly. Increased size of the cervix and body of the uterus in consequence of its interior being distended by the presence of the polypus, is traceable in those cases in which the polypus is of any great size. Not unfrequently intra-uterine, like vaginal polypi, are found combined with the presence of fibrous tumours in the walls of the uterus; and by these tumours the magnitude of the organ is increased, and its shape rendered more or less irregular. Fibrous tumours of the uterus are seldom or never situated in the walls of the cervix; and if the swelling and distension affect the cervix, there is consequently much more chance of its being a polypus and not an interstitial fibrous tumour, than when we have similar symptoms attendant upon a similar augmented state of the body of the organ. Further, the probability of the disease being intra-uterine polypus would be increased, if, on successive examinations, we had an opportunity of ascertaining that the enlarged and distended state of the cervix was descending gradually lower and lower down towards the os; for polypi in their progress and descent gradually dilate the cervix from above downwards in the same way as happens in pregnancy or abortion. They are born by a kind of chronic labour.

4thly. There may be symptoms of irritation and pressure upon the bladder, rectum, &c., if the polypus happen to be so large as to exert mechanical compression upon these or other parts, or dysmenorrhœa if it fills up the cavity of the cervix. And sympathetic pains may be present in the loins, limbs, &c., or there may be sympathetic disturbance of the stomach, heart, &c., if the uterus is much irritated and excited by the presence and distension of the polypus.

But one or more of the preceding groups of symptoms may be altogether absent, though the uterus contain an intra-uterine polypus. The mechanical and sympathetic symptoms last alluded to are the most uncertain of all. For while almost all uterine diseases, however intrinsically different, give rise to similar secondary and sympathetic symptoms, we have often in other instances of the very same diseases, these same symptoms entirely wanting; just as in one woman during pregnancy we sometimes see severe, even serious, local, and constitutional symptoms; and in another woman, or even in the same woman in another pregnancy, we see the same condition of the uterus unattended by any special, local, or constitutional disturbance. Again, there may be no ascertainable increased volume of the uterus, as the polypus, especially if it is vesicular, and originates in the interior of the cervix, may be far too small to lead to any appreciable augmentation in the size of the organ, although, notwithstanding, the menorrhagia may be great; for the extent of flooding does not depend on the size of the polypus, small polypi like small hemorrhoidal excrescences, often being the source of severe and repeated hemorrhages. Further, the leucorrheal discharge which is sometimes attendant, may be entirely absent, as the polypus may not be irritating the mucous surface of the cavity in which it is inclosed. And lastly, polypi occasionally, though not very frequently, are present for a long series of years without producing any degree of hemorrhage or menorrhagia. In the following case, for example, there was a state of long-standing amenorrhœa, instead of menorrhagia, co-existent with the presence of a polypus, though the two conditions (the amenorrhœa and polypus) had probably no causal relation to each other.

Case III.—A poor woman, from East Lothian, aged about 35, and of a weak and debilitated frame, came, some three or four years ago, to ask for advice regarding the state of her health. She described her case as one of long-standing amenorrhœa. For five or six years the catamenia had been entirely absent; and she ascribed her broken health to this cause. On examining the uterus and ovaries, in order to ascertain if there was any organic change to account for the amenorrhœa, I found, with the uterine bougie, the cavity of the os and cervix uteri very small, and the latter apparently obstructed, about three quarters of an inch from the orifice. I introduced a long thin sponge tent, with the view of determining more correctly the state of the cervical cavity. On removing the sponge, two days subsequently, I found the lower part of the cervix natural, but a flattened polypus, of the size of a small cherry, attached by a short pedicle to the interior of the higher portion of the cervical cavity. The pedicle was easily seized with a pair of long slender polypus forceps, and separated by torsion or evulsion. For some time subsequently to this little operation, menstruation recurred,—the irritation of the sponge tent having probably so far roused the uterus to a restoration of its secreting functions; but a patient from the same neighbourhood, about a half a year ago, informed me that her health had relapsed again into its former unsatisfactory state.

The polypus, in the preceding case, was intra-uterine. During the past autumn I removed a uterine polypus, which had long passed down into the vagina, and yet had never given rise to menorrhagia.

Case IV.—The patient, 55 years of age, had, for the last twenty-five years, been aware of the occasional protrusion, between the labia, of a portion of what she supposed a fold of thickened and insensible skin. When she first noticed it, she had called the attention of her medical attendant to it, an eminent London obstetrician, under whose kind care she was for many years placed. He examined the tumour and its relations; but advised her to let it alone. Two or three years ago a little sanious discharge began to appear, and continued to recur almost daily. On examining the projecting body, I found it an elongated polypus, of the size and figure of the fruit of the date, and depending by a long slender stalk, which passed upwards through the os uteri. I divided the stalk with a pair of blunt-pointed scissors, immediately below the os uteri, and in four days afterwards the patient set off on a long journey. The polypus was of a dense cellular structure. At one point, near its fundus, its surface was ulcerated. The ulcer was of about the size of a sixpence, and no doubt, the source of the discharge that had latterly appeared. Perhaps the removal of this polypus, when it was first discovered, would have enabled the patient to become a mother, and saved from extinction one of the highest and oldest titles in the kingdom.

Cases, however, like the above, of uterine polypi, of long duration, without attendant hemorrhage, are exceptions, and not very common exceptions, to the general rule.

When an adequate degree of dilatation is obtained, the finger will be enabled to touch the tip of the polypus; and then the pediculated or polypous character of the tumour may be farther made out by passing either the finger or a uterine sound between its body and the containing cavity of the uterus. In making this examination, as in making most other examinations of the uterus, a rule requires to be followed which is too often forgot, namely, to use both hands for the purpose. For if we are examining the uterus internally with the forefinger or fingers of the right hand, the facility and precision of this examination will be found to be immensely promoted by placing the left hand externally over the hypogastric region, so as to enable us by it to steady, or depress, or otherwise operate upon the fundus uteri. The external hand greatly assists the operations of that which is introduced internally; and farther, we can generally measure, between them, the size, relations, &c., of the included uterus.

If, without, or before, using sponge-tents, we are desirous to examine at the time when the os uteri is naturally most relaxed, we find that time to be either immediately after a menstrual discharge, or immediately subsequent to any severe attack of any intercurrent hemorrhage. Under such circumstances we can sometimes introduce the finger partially into the os uteri and ascertain the presence of any morbid body in the lower segment of the cervix; when in the same patient, at other times, this orifice is so complety shut as to prevent entirely such a proceeding.

[Remarking upon the fact that pain very rarely attends intra-uterine (as well as other) polypi, Dr. Simpson observes:]

Sometimes, however, as they are pressing upon the lower part of the cervix and os uteri, or distending and passing through these parts, uterine contractions and pains temporarily supervene, similar to those of miscarriage; and, if there is any difficulty in the passage of the tumour, these pains may become exceedingly severe. In a case, in which a fibrous tumour of the uterus that had undergone the calcareous degeneration, and part of which had assumed a semi-pediculated polypous form, the recurrent pains, when the mass came down upon the os uteri, appeared at times as extreme as those of the last stage of labour.

Case VI.—The patient, now sixty-nine years of age, the mother of several children, had for several years suffered from recurring slight attacks of uterine hemorrhage. In February, 1848, I saw her with Dr. Hunter. The os uteri was drawn up so high that it was with great difficulty that I could reach and touch it; the top of the vagina stretched up in the form of an inverted funnel, the apex being placed at its upper or narrow extremity, and hence it was impossible to introduce or use a speculum. At the same time the abdominal parietes were so thick and full, that it was impracticable to ascertain in any way the state of the uterus by an external examination. Not feeling a polypus, however, I left with the idea that the cause of the menorrhagia was some form of carcinomatous disease of the uterus. Subsequently, in the month of July, all her symptoms became aggravated, and very severe bearing down pains were superadded. These pains recurred regularly once a day, lasted in paroxysms for several long hours, and always left the patient weakened and prostrated. In consequence of them, Dr. Hunter made another examination of the vagina, and found the os uteri, which was now pressed lower down, filled with an apparently irregular bony mass. I saw her again, and removed the calcareous mass, filling up the os uteri, with a portion also of fibro-calcareous tumour, which we found above it, and distending the lower part of the cervix. The irregular calcareous portion protruded through the os uteri, was about the size of a hazel-nut, and the portion of fibro-calcareous tumour above it nearly four times that volume. The daily fearful pain which the patient had been lately enduring immediately ceased, and everthing looked so favorable that we had every hope that the whole of the fibro-calcareous tumour, or polypus, had been removed. Last February, however, after some unusual exertion, the pains again recurred more severely, if possible, than before; and with this difference, that the attacks of them were now twice a-day, instead of being only once, as on the first occasion. Opiates and sedatives had little or no effect towards their alleviation. On examining the os uteri, no new foreign body could be found anywhere within reach. As the patient's strength and spirits however, were rapidly giving way, I dilated the os fully, by a succession of sponge-tents, and found the cavity of the cervix occupied by another fibro-calcareous mass, larger than the first. After an ineffectual attempt to break it down and remove it, by strong lithotomy and other forceps, I dilated the os still farther with tents, with the view of, if possible, getting two or three fingers up to seize the tumour, and assist in its detritus and extraction. To allow the hand to pass into the vagina with this view, I was obliged to incise its orifice; and after no small difficulty, I was enabled to break of by the fingers and forceps, four or five fibro-calcareous pieces from the mass in the cervix; and these pieces, when afterwards conjoined together, were found to form a roundish semi-pediculated tumour, of the size of an orange. In order to enable her to sustain the pain of these proceedings, the patient was kept during this tedious operation, under the influence of chloroform. The pains again ceased, from the date of the removal of this second intra-uterine tumour; and, under the kind care of her son, himself a physician, our patient made a good and steady recovery, and her health was restored by spending some of the autumn in the country. There still, however, remains in the uterine parieties some fibro-calcareous structure, as I lately ascertained by passing a uterine bougie into the elongated cavity of the uterus, and striking it against its hard stony surface.

The *treatment* of intra-uterine polypi requires to be varied according to different circumstances, but particularly by the tendency or probability of the tumour passing downwards or not through the os; by the effects of the symptoms or the urgency of the case; and by the size and site of the polypus.

Two plans of procedure may be followed according to the nature and necessities of the case, viz., first, to wait till the polypus descend farther; or, secondly, to remove it immediately. It is a generally acknowledged principle in obstetric surgery, that a polypus of the uterus should be extirpated as early after its discovery as possible. But when such a tumour is discovered still included within the uterine cavity, and the polypus seems gradually but certainly making its way downwards, through the cervical cavity, and the hemorrhage and other symptoms are not urgent, it will assuredly be better to wait for its descent through the os; for after that its removal becomes much more easy and simple. The dilatation of the os and cervix by the sponge-tents will promote and facilitate its descent; and perhaps the internal use of the ergot of rye may aid it. But the degree of attendant hemorrhage and debility may be too great to entitle us to postpone the removal of the polypus; or the tumour may be attended by such a short pedicle as not to be capable of leaving the uterine cavity without dragging down with it, or inverting the fundus or some parts of the parietes of the uterus; or it may be retained in its descent by adhesions formed between the surface of the uterus and the surface of the polypus. I once witnessed the dissection of a case of a large fibrous polypus included in the cavity of the uterus, and where inflammation had been present before death; the surface of the polypus was adherent to the surface of the uterus through the medium of a recently effused false membrane.

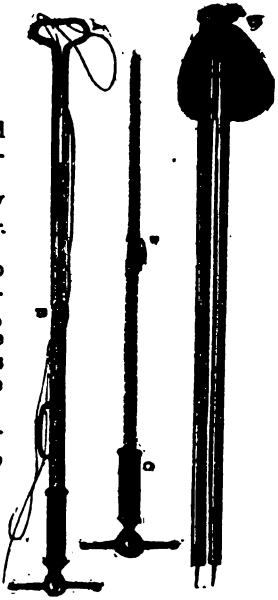
[Where, then, there is severe hemorrhage, and improbability of the speedy descent of the tumour, Dr. Simpson thinks that we ought to remove it at once. The first step in the operation is the dilatation of the os uteri by means of sponge-tents; and the division of any obstructing bands of the os or cervix, at the time of operation. The removal of the polypus will then be effected in different ways according to circumstances. Dr. Simpson says:]

We may only be able to accomplish this object by contusing and crushing the tumour, as I have described in a case already detailed. (See Case II.) In the instance in question, I grasped the polypus, for this purpose, with strong lithotomy forceps. In another similar case, after fully dilating the os and cervix, I seized a large intra-uterine polypus between the jaws of a screw-propelled lithotomy instrument—invented for the purpose of crushing vesical calculi—and was enabled, by it, to crush and destroy readily the structure and vitality of the included tumour. Occasionally, we may be enabled to divide the stalk of the polypus with a silver wire or ligature, acting on the principle of the chain saw; or we may [reach] it with very curved blunt-pointed scissors. The following case will serve to illustrate one of the last-mentioned methods of operating:—

Case VIII.—A patient, æt. 36, about three years ago began to suffer under menorrhagia and dysmenorrhœa. The catamenia became both too frequent in their return, as well as much too great in quantity; but there was little or no leucorrhœal discharge. Latterly coagula of blood accompanied the menstrual periods, and the patient felt much weakened by each attack, The dysmenorrhœa generally came on on the second day of menstruation. and confined the patient for a couple of days, the third day being usually one of much sickness as well as pain, particularly if the patient tried to assume the erect posture. I first saw this lady in July of the present year, and found the uterus somewhat enlarged, and externally irregular in form, from the presence of one or two small fibrous tumours in its body and fundus. But the os uteri was shut, and I could not ascertain if the debilitating hemorrhage was the result merely of the irritation of these tumours in the parietes of the uterus; or whether one of them, forming a polypus in the cavity of the organ, was its source. I wrote her medical attendant to dilate the os in order to determine this point; and she returned home to England. In September she came back to Edinburgh; but, in consequence of the state of her health, I did not venture to dilate fully the os and uterine cavity till towards the end of October. On doing so, I was enabled to detect the rounded extremity of a polypus hanging down, into the cervical cavity. During two or three days it descended somewhat lower, but ultimately remained fixed and stationary above and within the os. I found I could not move it further downwards, by fixing a vulsellum into it, and applying some dragging force. On the 6th of November, assisted by Dr. Duncan, I applied a silver wire above the body, and around the neck of the tumour, by the instrument figured in the accompanying wood-cut. After the instrument was fixed and adjusted, a few turns of the screw made the wire cut through the pedicle of the polypus, and without any pain or suffering on the part of the patient. The separated tumour was then pulled, by the vulsellum, through the os uteri. The polypus was of the size and shape of a plum, with a small portion of the pedicle attached. It was fibrous in its internal structure. The patient's recovery was slow, but uninterrupted. She has menenstruated once since the operation, but without the discharge being excessive, as formerly, either in quantity or duration (it lasted only three days;) and also without her former distressing dysmenorrhœal pains.

The instrument employed in the preceding case is a modifiation of one kindly sent to me by my friend, Dr. Sabine, of New York. I am told it has been successfully used by various American practitioners for the removal of polypi in the vagina. The advantage which it possesses over the instruments of Niessens, Gooch, Davis, and others, in the removal of intra-uterine polypi is, that the screw power with which it is furnished, enables us to use it with the power of a small chain-saw, for the immediate division of the pedicles of the polypi. And it is almost superfluous to observe, that if we can finish our operation, it will be much safer for our patient than leaving a rough instrument within the cavity of the uterus. The instrumnet itself consists of two parts, viz., two hollow canulæ, like those pertaining to the instruments of Niessens and Gooch; and of a second part, resembling the polypus instrument of Graefe of Berlin, with this difference, that it has a ring affixed to its top, of a heart-shaped figure, and intended, first, to receive the two canulæ, with their contained ligatures, and afterwards to serve as a point of resistance during the cutting action of the ligature upon the pedicle of the tumour. The canulæ and ligatures (Fig. 3) are first applied in the same way, and according to the same rules, as those of Niessens and Gooch. After the pedicle is encircled by the ligature, the two lower extremities of the canulæ and included ligatures are passed through the ring (*a* Fig. 1) of the second portion of the instrument. This portion of the instrument is then run up, with its ring surrounding the included canulæ, till it reaches the pedicle of the tumour; the projecting side of the ring being turned towards the pedicle. The canulæ are then slipped off and withdrawn, leaving the wires or ligatures alone in the terminal ring of the instrument. Subsequently, these wires are twisted around, and fixed upon, the knob (*b*, Figs. 1 and 2) attached to the screw (Fig. 2.) Lastly, by moving the knob downwards, by the operation of the screw, the ligature is made to cut into and through the pedicle.

Fig. 1. 2. 3.



The wood-cut shows the instrument alluded to, for seizing and dividing the pedicle of a polypus.

Fig. 3 represents the two canulæ as they stand after their contained wires have been passed around the pedicle, *d* (Fig. 3,) of a polypus.

Fig. 1 shows the instrument used specially to to divide the pedicle; *a* is the ring of the instrument, into which the canulæ are slipped, and which is run up along them to the pedicle (*d*;) *b* is the knob or bottom on which the wires are twisted—it is made to descend along the linear slit by revolvng the handle *c*.

Fig. 2 shows the screw enclosed in the instrument (Fig. 1,) with the handle *c*, and button *b*, in which it moves.

The preceding remarks, relative to the treatment of intra-uterine polypi, principally refer to these tumours when they happen to be of a large size. But uterine polypi are often too small to be removed by the knife, scissors, or ligatures; and yet these small polypi not unfrequently lead to severe and long continued menorrhagia. From the analogy of hemorrhoidal tumours, we know that the mere size of a polypus is not to be taken as any measure of its capability of producing hemorrhage. Small vesicular, mucus, or cellular polypi sometimes grow from the fundus uteri, giving rise to considerable and long-continued hemorrhagic discharge. I have preserved specimens of them from the dead subject, and have met with them in the living. They can hardly be porperly termed polypi, as they are scarcely pediculated at their attachment, and sometimes short, but in other cases long and slender, in their body.

The following case may be cited as an illustration of this form of the disease.

Case X.—A lady, the mother of ten children, became irregular in her menstrual discharge during her 44th year. At times it was wanting at the usual monthly periods, at others it amounted to menorrhagia. About a year after this irregularity commenced, such an amount of fluid blood and coagula escaped as at first to lead on her part to some suspicion of miscarriage; but it continued to go on profusely for two or three weeks. At the end of that time, I visited her, with Mr. B. Bell, and Dr. Malcolm. On examing the uterus, we found a small vesicular polypus attached to the inner surface of one of the lips of the os, and it was easily removed by avulsion. The discharge, however, was not abated in consequence, as we expected. A series of sponge-tents was then introduced, so as to open up, first, the cavity of the cervix (which was found free from additional polypi), and ultimately the cavity of the body of the uterus. When the distension of the whole uterine cavity was at last completely effected, both Dr. Malcolm and I found that we could touch two or three small slender polypoid bodies, hanging from the very fundus of the uterus. I removed them cautiously from the surface to which they were attached, with the nail of the first finger. After this the hemorrage ceased, but some, local treatment was required to cure the ulcerated state of the cervix. The polypi were removed in April. The patient went soon afterwards to spend the summer in the country, where she soon gained strength, and enjoyed much-improved health. I saw her lately. The menorrhagia had not recurred, but she still looked anemic, having never recovered her colour since the hemorrhages in spring.

Dr. Malcolm informs me that, since meeting with the above case, he has seen another similar one, and treated it successfully in the same way. I may add, that in several cases of chronic and severe menorrhagia, in which I have been induced to open up the cavity of the uterus with sponge-tents, in order to ascertain whether there was any small intra-uterine polypus present or not, I have merely found the interior of the uterine cavity rough and granulated at particular points, which I have generally tried to remove and scratch off with the nail. Whether owing to their removal or not, or owing to the irritation resulting from the pressure and distension of the sponge, I know not, but certainly in two or three cases, the menorrhagia has subsequently abated and ceased.

By far, however, the most common site for the origin of small vesicular polypi, is the interior of the cervix uteri. In fact, the small cellular or vesicular form of cervical polypus, is infinitely the most common form of polypous disease of the uterus.

It is, I believe, the rule rather than the exception to it, that when we find one (perhaps protruding at the os uteri,) we shall find on further search, that there are others, sometimes to the number of four, five, or six, springing from other points of the interior of the cervix, and not discoverable till the cavity of the cervix is dilated by a sponge-tent. When hanging from the os uteri, their stalk is sometimes so loose and long, and the small depending polypus is itself so small and soft, that it moves away before the finger in making a tactile examination, and one unaccustomed to this peculiarity will not feel perfectly sure of the presence of such a polypus till the speculum is used, when the polypous body will be easily seen generally of a cherry-red, or purplish colour. Such polypi, though small, are often apparently the source of much menorrhagia and leucorrhœa, for they almost always co-exist with, and probably produce, some degree of ulcerative inflammation of the contiguous surface of the cervix.

In trying to remove these small vesicular polypi of the cervix, it is therefore, to be held in recollection, that there are generally more than one present, and that to ascertain this point with any precision, it is necessary to dilate and expand the cavity of the cervix with a sponge-tent.

In more than one instance I have found these polypi (when their pedicles were perhaps long and easily broken) come off, imbedded in the surface and foramina of the sponge, which had torn them off during its expansion. But, in twenty-nine out of thirty cases, more methodic measures are required for their removal,—as scratching them off with a sharp nail, seizing and tearing them off with polypus forceps, or dividing their stalks with a pair of scissors. If we can use the speculum, these modes of removal are greatly facilitated by the sense of sight. Indeed, if we require to use the polypus forceps or scissors, for the removal of these small polypi, and guided by touch alone, we shall generally find the operation, though apparently simple in principle, one which is tedious and difficult to perform in practice.

The small vesicular polypi of the cervix have, sometimes, as we have already seen, long pedicles. Occasionally, however, we find, co-existing with these pediculated polypi, others that are non-pediculated or sessile; and, occasionally, after the cervix is dilated, we find others not raised yet above the level of the general surface of the mucous membrane of the part, but feeling imbedded like shot or peas in or beneath that membrane. In other words, we find, in some cases, these vesicular polypi in all their stages of formation, from small shut cysts, up to pediculated vesicular tumours. When such is the state of matters, we can only remove those that are more fully formed, by the nails, scissors, or forceps. To effect a complete cure, we require other means; and for this purpose the application of caustics to the mucous membrane of the cervix answers every indication. Nitrate of silver generally proves too weak for this purpose, unless repeated very often, and combined with scarification of the mucous surface. We possess a far more potent and certain caustic for the purpose, and one that is perfectly manageable, in potassa fusa. The surface of the os and cervix, when small vesicular polypi exist, is often found to be the seat of chronic inflammatory ulceration; and sometimes the submucous tissue, and the structure of the cervix, is also the seat of chronic inflammatory hypertrophy and induration. When such a combination exists, the potassa fusa is doubly useful, as its application at once destroys the polypi, and sets up a new and healthy action in the affected and morbid tissues of the cervix. I have described elsewhere, its great value and mode of application in inflammatory induration of the cervix, and the power we have of immediately arresting and limiting its action by the neutralising effects of acetic acid. I need only add here, that I have now repeatedly found this caustic of the greatest possible use in obstinate and complicated cases of vesicular polypi of the cervix, such as I have above alluded to.—*Monthly Journal of Med. Science, Jan.* 1, 1850, *p.* 3.

139.—ON THE SUPPOSED FREQUENCY OF ULCERATION OF THE OS AND CERVIX UTERI.—By Dr. Tyler Smith, Physician to Queen Adelaide's Lying-in-Hospital.

[Referring to the statements made by Mr. Whitehead of Manchester, and Dr. Henry Bennet, on the frequent occurrence of ulceration of the os and cervix uteri, Dr. Smith observes:]

Practising as a physician-accoucheur, I must get the same class of patients as those treated by Mr. Whitehead and by Dr. Bennet. I am in the habit of using the speculum in cases of obstinate lucorrhœa in married females, and I trust with a desire to observe truly and faithfully, but I do not myself find uterine ulceration, at least not what seems to me to warrant this term, so frequently as Dr. Bennet, Mr. Whitehead, and some other gentlemen who have written upon the subject, in lucorrhœal cases—purulent or muco-purulent. I find inflammation, engorgement, induration, excoriation, patches of aphthæ, epithelial abrasion, and granulation often enough, but very seldom what I could call ulceration, in non-malignant and non-syphilitic cases.

The clearest description I can find of the so-called ulceration, is in Dr. Bennet's work, (pages 102 and 103), which I take the liberty of extracting, and certain expressions in which I have italicised; it occurs under the heading—

"*Inflammatory Ulceration.*—Inflammation may exist for years in the cervix and its cavity, without giving rise to any other anatomical changes than those which have been enumerated. This, however, is seldom the case. The mucous membrane lining these regions, and more especially that portion of it which is near the os, appears to be *peculiarly liable to take on ulcerative action.* Consequently, the existence of inflammation *in the great majority of instances* is soon followed by the manifestation of the ulcerative process. Ulceration generally appears first round the os, and just within the cavity of the cervix. Many different forms or species of ulceration are described by continental writers, but, in my opinion, without necessity or advantage. An ulceration occupying the cervix uteri may present all the various modifications which suppurating surfaces offer in any other part of the body, from the minute granulations of a slight abrasion, to the livid vegetations of an unhealthy sore; but these modifications of the ulceration require in reality no division or classification.

"When an abrasion or excoriation only is present, the cervix is generally of a vivid red, and the granulations are often so minute, that it is at first difficult to ascertain whether the mucous membrane is abraded or merely congested, or to perceive the limit of the ulceration when once it has been ascertained to exist. The doubt, however, may be solved by lightly touching the suspected surface with the nitrate of silver. The abrasion immediately assumes a much whiter hue than the region which is merely congested, and its margin becomes well defined and evident. *An abraded or excoriated condition of the mucous surface is generally the form under which ulceration presents itself in the cavity of the cervix,* granulations of any size being seldom met with in this region.

"In its more decided form, ulceration of the cervix uteri is susceptible of presenting every possible variety. The granulations may be firm, of a vivid red hue, scarcely bleeding on pressure, or they may be large, fungous, livid, and bleeding profusely on the slightest touch. These fungous ulcerations are generally connected with torpor of the local circulation; when they are present, the congestion of the vagina and cervix is often very great, of a livid venous character, and the non-ulcerated surface of the cervix may present dilated varicose veins."

Now, this portrait, the general fidelity of which I admit, does not appear to me to warrant the profuse use of the term "ulceration," which in itself, and when applied to other parts of the body, has a definite and unmistakeable meaning. It cannot truly be said, that mere abrasions or excoriations caused by irritating leucorrhœal discharges are "ulcerations." We do not call the excoriation which occurs from similar causes in other parts of the body "ulceration." We do not call granulations upon mucous membranes "ulcerations," whether they secrete mucus or pus, or whether they bleed or not upon mechanical irritation. If we analize this important passage closely, we shall find that granulations at the os and cervix uteri is the strongest fact testified to in support of the theory of "ulceration." Dr. Bennet states, that "an ulceration occupying the cervix uteri *may present all the various modifications which suppurating surfaces offer in any other part of the body*, from the minute granulations of a slight abrasion to the livid granulations of an unhealthy sore." But, immediately afterwards, he negatives this by adding, "*An abraded or excoriated condition* of the mucous membrane is generally the *form* under which ulceration presents itself in the cavity of the cervix, granulations of any size being very seldom met with in this region." Thus, it is evident, that even in the absence of granulations, Dr. Bennet calls "an abraded or excoriated condition" a "form" of "ulceration." From his own descriptions, it is evident that Dr. Bennet classes abrasions, excoriations, and granulations together, as forms of ulceration, a proceeding which it appears to me is utterly opposed to all sound pathology. In this way we may explain the great frequency with which ulceration of the os and cervix uteri is declared to be met with.*

If we consider excoriation or abrasion as genuine ulceration, probably no woman ever passed through life without suffering from this form of disease. In the virgin uterus, the circulation is frequently modified by the recurrence of menstruation, ovarian irritation, mental emotion, the varying conditions of the bladder and rectum; and in constitutional ailments, the vaginal and uterine secretions, in common with the other secretions of the body, are frequently depraved. Excoriation and abrasion of the mucous membranes are easily accounted for under such circumstances. Menstruation alone, in the turgidity of the uterus and ovaria, before the catamenial flow is established; in the exudation of blood from the surface of the uterus; and in the perforation of the peritoneal membrane for the elimination of the ovule from the ovary, trenches very nearly upon pathology. The slightest divergence from the ordinary function merges into disease.

In married women, and those who have borne children, other prejudicial causes in addition to these are in operation—such are the mechanical irritation of coitus, the risk of laceration of the os uteri during the passage of the child in parturition, and the state of the uterine orifice which obtains after labour, and the return of the organ to quiescence. After labour, the orifice of the uterus does not contract smoothly, so as to leave the os uteri regular and even, but it becomes puckered and contracted unevenly. In irritable conditions of the mucous membrane of the uterus and vagina, or in a morbid state of the utero-vaginal secretions, these folds or corrugations are very liable to be chapped or excoriated, and I believe this is often mistaken for ulceration. All these, and other causes which I might enumerate, explain the frequency with which the os uteri deviates, in colour, volume, and secretion, from the strictly healthy standard. In fact, we may compare the upper part of the vagina to the fauces, which is seldom found perfectly healthy in any subject who may be examined. Some of the indurations and enlargements of the os and cervix uteri appear to resemble enlarged tonsils, and, like them, to increase in size without any amount of active inflammation.

The granulations which are sometimes found surrounding the os uteri—which may secrete mucus or pus abundantly, and which may bleed on being roughly handled—are, I have no doubt, the result of inflammation; but they resemble *the granular state of the conjunctiva*, rather than the granulations of a true ulcer, the granular os uteri offering no edges or signs of solution of continuity, by which we might satisfactorily declare it to be an ulcer. The *granular os uteri* would be a more correct designation, in such cases, than "ulceration" of the os uteri. Some of the so-called ulcerations appear to be nothing more than patches of thickened epithelium, or portions of the os and cervix, from which the epithelium has been melted away by acrid or irritating secretions. We can imitate this condition of the parts by the slight application of the nitrate of silver—sufficient to affect the epithelial covering, but not sufficient to injure the mucous membrane beneath.

It appears to me that we can neither receive the existence of excoriation or abrasion; of granulation or fungous growths; the secretion of pus or muco-purulent matter; as affording undeniable evidence of the existence of "ulceration" of the os and cervix uteri. We must try ulceration in this part of the body by the same test which we apply to ulcers in other parts of the economy.

We must look for a solution of continuity, with a secreting surface, separated from the healthy structures, having defined edges, everted or inverted,—for an ulcer, in fact, in the common pathological meaning of the term. We find ulcers having these characters in the air-passages, mouth, stomach, intestines, bladder, and other mucous surfaces. There is no mistaking the characters of an intestinal ulcer after dysentery, and there ought to be no mistake about an ulcer of the uterus. Indeed, in the corroding ulcer of the uterus we unfortunately see that this organ is but too capable of taking on all the qualities of ulceration, in a degree only equalled by its extraordinary vitality, the organ being scooped out, or eaten away, in a comparatively short space of time. Cases are also met with in which the os uteri has been destroyed by the sloughing, ulceration, and loss of structure, sometimes following the application of the more powerful caustic agents. We are, however, called upon, by the unlimited believers in uterine ulceration, to admit that ulcerative disease may exist for years, in its common form, without any perforation, excoriation, serious loss of substance, or altered configuration. Whether we test the so-called ulceration of the uterus by ulceration occurring in other mucous surfaces, or in the uterus itself, under undoubtedly ulcerative disease, the distinctive characteristics are wanting in the great majority of cases; and they certainly are not found, unless I am most egregiously mistaken, in the enormous proportion of 222 cases of ulceration to 300 cases of promiscuous uterine disease.

In all that I have said, I do not wish it to be supposed that I question the frequency of irritation, chronic inflammation, and sub-acute inflammation, in connexion with leucorrhœa. Recent writers would, however, treat leucorrhœa merely and solely as a symptom, not as an independent disorder. But I am well assured that it is often the disease itself, or at least all of it that we can appreciate; and that the irritable or inflammatory condition is excited secondarily, and mainly, by the morbid leucorrhœal secretion. Some change in the innervation or nutrition of the organ occurs; or it sympathises with a malady in some remote organ, and the secretions are consequently depraved. These depraved secretions irritate the surfaces with which they come in contact, and produce the visible signs of irritation or inflammatory action. We see these discharges sometimes inflame and excoriate even the external integument, but we should never dream of saying that the inflamed condition of the skin was the essential part of the disorder. The same observation applies to the uterus. Thus it is not pathological, nor useful, always to consider leucorrhœa as a mere symptom; and the old plan of astringent injections, though sometimes mischievous, cannot quite be dispensed with, for in some, even profuse leucorrhœas, an astringent injection, by arresting the utero-vaginal discharges, does more than any other plan to soothe inflammatory conditions, or rather, to suspend their causes.

[Dr. Smith also refers to the results of post-mortem examination. He states that out of 100 women examined *after death* by Mr. Pollock, at St. George's Hospital, only *four* cases presented distinct ulceration of the os uteri; and in three of these cases there was scrofulous ulceration in other parts of the body. Again, out of 180 women, subsequently examined *after death* at the same hospital, by Mr. Gray, only *three* cases presented distinct ulceration of the os and cervix. And similar results have been arrived at by other observers. In many cases, however, "slight abrasions, discolourations, and granulations were observed." Dr. Smith proceeds to remark:]

It may be asked, why bestow so much pains on proving that abrasion, excoriation, and granulation are not *ulceration*? Why dispute as to terms? Simply because a name rules treatment, and because the name of "ulceration" being first given, an heroical treatment, not without danger, is frequently resorted to where milder local applications or constitutional treatment would be equally efficacious. After Mr. Abernethy wrote his celebrated work on the 'Constitutional Treatment of Local Disease,' his idea was pushed to its extreme, and local remedies were often most improperly neglected. Now, in all that relates to the uterine organs, the doctrines of Mr. Abernethy are in danger of being entirely refuted, and we are in some risk of utterly neglecting constitutional treatment, and of being entirely absorbed by local applications. This we cannot do without impeding the improvement of the treatment of this class of affections. When a patient is told she has an ulceration of the womb, she often thinks of an ulcer of the leg, or the cheek. &c., and is proportionably frightened, because of the importance of the organ which is the seat of the presumed disease. There is nothing women will not submit to to be freed from such a dire malady. At the present time a veritable uterine panic affects the upper and middle classes of society, and every woman with the slightest ache or discharge, is not satisfied until the peccant organs have been ocularly inspected. I do not believe that this state of things, or its inevitable results, will conduce to the dignity and respectability of our profession. I do not hesitate to affirm, so far as I have eyes to observe and a judgment to weigh facts, that much exaggeration prevails respecting the frequency of this same ulceration of the os and cervix uteri—an exaggeration which should be calmed, so that the legitimate methods of examination may lead, not to a suspicion of our profession, but to real improvement in the diagnosis and treatment of the uterine disease as it actually exists. We cannot safely repudiate either the local or the constitutional treatment of uterine disease. I have seen cases in which the local ailment has been as far as possible cured; nevertheless, the constitutional symptoms remained unrelieved. I have seen others, in which judicious constitutional treatment has cured the local malady without any topical treatment whatever. But in the combat against disease, we require both constitutional and local weapons; and any views which disparage either the one or the other, must cripple the resources of our art.—*Lancet*, *April* 20, 1850, *p.* 473.

140.—M. VELPEAU ON UTERINE AFFECTIONS.

Has not too much importance been attached to the various states and displacements of the uterus? Has not the treatment of uterine affection been much too localized, especially since the exaggerated doctrines of Lisfranc on this head? Such were the questions lately discussed at the Academy of Medicine of Paris, being suggested by a paper of Dr. Baud on the deviations and congestions of the uterus, with a new mode of curing these affections.

The tendency of the paper was to show that all the diseases of the uterus are much influenced by the general state of the health, and that the local condition ought to be considered only as a passive and secondary state. M. Velpeau expressed himself very sceptically as to the engorgements of the uterus, and M. Gibert spoke favourably of the notions of the older practitioners, who saw in the diseases of the uterus the manifestation of a diathesis which they combated by general means; the uterus being then considered as a cleansing organ, and the discharges not prevented. It would seem that the tendency to localize is rather too much indulged in now a-days, and it will certainly occur to many a pathologist that revision is somewhat necessary in reference to uterine affections.—*Lancet*, *Dec.* 22, 1849, *p.* 671.

141.—ON INFLAMMATORY ERUPTIONS UPON THE CERVIX UTERI.—By Prof. SIMPSON, Edinburgh.

[The following observations were made by Dr. Simpson, at a Meeting of the Edinburgh Medico-Chirurgical Society:]

The common forms and effects of inflammation of the cervix uteri, viz. ulceration, hypertrophy, and induration of the cervix, were now well known to the profession. But the surface of the cervix was liable to other types of inflammation of an eruptive character, which apparently had hitherto been little, or not at all, studied by obstetricians: and were not yet described in works upon the pathology of uterine diseases. Among these special inflammations of the cervix uteri and top of the vagina, Dr. Simpson had observed eruptions referable to the vesicular, pustular, tubercular, papular, and erythematic orders of the classification of Willan and Bateman. *Herpes* (*herpes uterinus*) he had seen following the usual course of *herpes labialis* in two or three instances, in patients who had months previously been under treatment for common ulceration of the cervix; and Dr. S. suggested that perhaps this and other eruptions were occasionally the origin and basis of the common variety of granular cervical ulcer. *Acne*, in the form of chronic, hard tubercles and pustules, was by no means uncommon, and often co-existed with common ulceration. A papular form of eruption sometimes supervened in chronic cases of uterine disease, and was usually diffused over both the cervix uteri and interior of the vagina; sometimes having the characters of *Lichen;* in other instances presenting the appearances and severe itching symptoms of *Prurigo*. Eczema and patches of *Aptha* also occurred. The treatment required to be varied according to the nature and character of the eruption, and consisted of the application of nitrate of silver, of medicated washes, and medicated pessaries, &c. In severe and distressing cases of prurigo of the cervix, vagina, and vulva, brushing the affected surface over with hydrocyanic acid (the strength of that of the Edinburgh Pharmacopœia), was mentioned as often giving the greatest relief.

Dr. Pattison mentioned a case of prurigo of the vulva, which Dr. Simpson had seen with him, and where the hydrocyanic acid had at once afforded perfect relief.—*Monthly Journal, April,* 1850, *p.* 386.

142.—ON INTERNAL METRITIS, OR UTERINE CATARRH.—By Dr. J. Henry Bennet.

[The following observations are from Dr. Bennet's work on "Inflammation of the Uterus and its appendages":—]

Internal Metritis or Uterine Catarrh (as defined by Dr. Bennet) is a rare disease:

It has only been considered common because it has been confounded with inflammation of the *cavity of the cervix*, a disease which, on the contrary, is very often met with. The mucous membrane that lines the cavity of the cervix, as we have seen, instead of being rudimentary, like that which lines the uterine cavity, presents a certain thickness, is plaited in folds, is abundantly studded with mucous follicles, and presents a more extensive surface than the uterine mucous membrane. It is not generally known, that the uterine cavity, in the unimpregnated state, is exceedingly limited in extent; so much so indeed, that, according to M. Vidal de Cassis, who made some years ago, many careful experiments, in order to ascertain its capacity with reference to the use of injections in the disease we are studying, the uterus of a full-grown woman does not contain more than from nine to eleven minims of fluid. The cavity of the healthy cervix, if distended, contains about as much. The two cavities are distinctly separated one from the other, as I have explained, by a constriction, or natural sphincter, which has not been described by anatomists, but which is sufficiently powerful to offer a decided obstacle to the introduction of the uterine sound into the cavity of the uterus, in the healthy state. The existence of this constriction was first pointed out to me, some years ago, by Dr. Simpson of Edinburgh, as an indication of a morbid condition; but my subsequent researches have led me to believe that it exists in the healthy state, and that it is not *necessarily* morbid, even when carried to such an extent as to render the introduction of the uterine sound impossible. The cavity of the cervix is also deeper by half an inch than that of the uterus itself. The uterine sound, when passed into the uterus, is concealed to the extent of two inches and a half; of which, one and a half occupies the cavity of the cervix, whilst one inch only is in the uterus.

The above anatomical facts will at once explain the cause of the error into which even the latest continental writers on uterine catarrh have fallen. Whenever, on examining the cervix with the speculum, mucopus is observed issuing from the os uteri, they conclude, without further examination, that it proceeds from the *cavity* of the uterus, and that the latter is the seat of inflammation. They do not reflect that the muco-pus *may* proceed, as it really does in nineteen cases out of twenty, from the cavity *of the cervix.* The result of a careful examination of all the cases of inflammation of the cervix uteri that I have seen during the last three years, amounting to between five and six hundred, with reference to this point, has shown me that, in the immense majority, the inflammation does not extend into the cavity of the uterus. I have been led to this conclusion by the observation of the following facts:—Firstly. The dilatation which invariably *accompanies* inflammation of the cavity of the cervix, does not, generally speaking, extend to the internal constricted point, or 'os internum'; the latter remaining contracted, so as not to allow the free admission of the sound into the uterine cavity. Secondly. Therapeutical means, carried so far only as the morbid dilatation exists, or to the os internum, effectually cure the inflammation, and put a stop to the discharge.

In some few cases, on the contrary, the os internum participates in the relaxation of the cervical cavity, so that the sound passes freely into the uterus,—the two cavities communicating. When this is noticed, the cavity of the uterus may or may not be inflamed; if it is, the discharge from the os uteri is more abundant, and presents peculiar characters; the local and general symptoms are rather different; and, what is conclusive, therapeutical agents carried into the cavity of the cervex alone, may not be sufficient to effect a cure. These latter cases are really cases of internal metritis, or uterine catarrh. The former (by far the more numerous) I look upon as cases of inflammation of *the mucous membrane lining the cavity of the cervix only, or of cervical catarrh.*

Causes. All the causes which give rise to acute or chronic metritis, may also occasion internal metritis. It appears, however, to be generally met with in practice, as the result of the lengthened existence of inflammatory disease of the cervix and of its cavity. The inflammation gradually progresses along the cavity of the cervix until it reaches the os internum, and passes into the uterus. Indeed, considering the extreme frequency of inflammation of the entire cavity of the cervix, it is only surprising that the disease should so generally stop at the internal sphincter of that organ. The cause, however, of this clinical fact is, no doubt, the change in the structure of the mucous membrane, which commences at this point.

Among the causes most likely to give rise to internal metritis, a prominent position must be given to the inflammations that occur after parturition and abortion. When inflammation of the uterus follows the expulsion of the ovum, the surface on which the placenta was implanted is peculiarly liable to be attacked, and the seeds of chronic inflammation of the uterine lining membrane may thus be sown. In some exceptional cases, blennorrhagic inflammation may be a cause of internal metritis; the inflammation gradually extending from the vagina to the cervix, to its cavity, and to that of the uterus. This, however, I believe to be much less frequently the case than has been asserted.

Symptoms. Internal metritis being nearly always complicated by inflammation of the cervix, of its cavity, or of the substance of the womb, its symptoms are rather difficult to unravel; so difficult, indeed, that I do not believe the task has yet been accomplished satisfactorily by any writer. Internal metritis may be said to exist to a certainty, if the os internum of the cervix is so completely open as to allow the uterine sound to pass freely into the uterine cavity; if that cavity is increased in size, and more sensitive, and if, likewise, there is a more or less abundant *sero-sanguinolent* discharge, accompanied by dull, deep-seated pain in the region of the uterus itself,—that is, behind and slightly above the pubis,—and by a certain amount of general febrile reaction.

The sero-sanguinolent discharge is the most important of these symptoms; indeed, it may be said to be as characteristic of internal metritis as the rust-coloured expectoration is of pneumonia. The presence of blood in the secretion from the inflamed mucous surfaces is, in both cases, owing to the same cause—viz., the absence of an epithelial covering. The epithelium ceases to exist in the cavity of the uterus as in the cells of the lungs; and, when this is the case, the blood corpuscles exude in inflammation, and blood is expelled mingled with the secretion of the inflamed surface. This sanguinolent discharge, however, is not always present when there is inflammation of the interior of the uterus. It is only when the inflammation is severe, or in its period of greatest intensity, that it is observed. At the onset, in the period of decrease, and sometimes throughout the entire duration of the disease, the secretion may be merely muciform or puriform. When congestion alone remains, it may consist only of transparent mucus. If this is the case, it becomes more difficult to distinguish internal metritis from inflammation of the cavity of the cervix, in which the same discharges are present; in both, they may be seen issuing in a thick stream from the os uteri, when the cervix is brought into view with the speculum. We can then only be guided by the amount of discharge, by the morbid dilatation of the os internum, and by the other symptoms which I have enumerated.

In the healthy unimpregnated uterus, as I have stated, the cavity of the uterus is only one inch in depth, and so extremely small as merely to contain a few drops of fluid; consequently, the uterine sound, once introduced, has but an exceedingly limited range of motion. In internal metritis, the cavity of the uterus is dilated, increased in size, and the uterine sound moves with more freedom; the presence of the sound in the uterus, and its contact with the walls of its cavity, seem also to be attended with more pain than usual. This symptom, however, cannot be much depended upon, as the introduction of the sound generally occasions pain even in the healty uterus; not unfrequently giving rise to nausea and faintness. Indeed, the cavity of the uterus appears to be naturally as sensitive as that of the cervix, and its os is little so.

Internal metritis is nearly always accompanied by a dull, aching pain in the back or ovarian regions, similar to that experienced in inflammation of the cervix, and by deep-seated pain in the region of the uterus. The uterus is generally rather swollen, enlarged, and sensitive to the touch, the entire organ being in a congested, irritable state. Internal metritis is also often accompanied by a slight amount of febrile reaction, occurring at intervals, after exertion, instrumental interference, or at the monthly periods. The catamenia are often disordered, generally manifesting themselves more frequently and more abundantly, lásting longer, and being attended with more pain than usual. Sometimes the flow of blood is so great and so lengthened as to constitute flooding; and this is more especially observed, as might be anticipated, when the sero-sanguinolent discharge is present. With some patients, however, on the contrary, the menstrual secretion appears to be diminished: but in either case it may be laid down as a rule, that the disease is aggravated by the appearance of menstruation. In addition to these symptoms, all the general sympathetic reactions which are observed in chronic metritis, and in chronic inflammation of the cervix, may be present. As internal metritis is generally complicated by these diseases, we may also have the peculiar symptoms which they present.

In some rare instances, inflammation of the lining membrane of the uterine cavity is followed by ulceration. When this is the case, the cavity of the uterus becomes considerably enlarged, and large quantities of pus, blood, and mucus, collect within it, and are expelled through the os uteri. Dr. Hall Davis exhibited, a short time ago, to the Pathological Society, the uterus of a woman thus affected, who died under his care; there were several large ulcerations on the internal surface of the organ. There are other cases on record; but this termination of internal metritis is undoubtedly very rare. The rudimentary mucous membrane of the uterus does not seem very liable to the ulcerative stage of inflammation.

From what precedes, it will be evident that, although a careful digital examination, combined with the use of the uterine sound, enables us to appreciate many of the symptoms of internal metritis, yet we can only obtain all the information we require to form a diagnosis, by carefully examining with the speculum the condition of the uterine organs. The cervix should be brought completely into view, in a good light, so as to enable the medical attendant, not only to ascertain its precise condition, and that of the inferior and external portion of the cavity of the cervex, but likewise to appreciate the amount and precise nature of the discharge that issues from the os uteri.—*London Journal, Feb.*, 1850, *p.* 147.

143.—ON THE TREATMENT OF INFLAMMATION OF THE CERVIX UTERI, AND ITS CONSEQUENCES.—*By* DR. J. HENRY BENNET.

[The following is from a review of Dr. Beunet's work, in the 'British and Foreign Medico-Chirurgical Review.']

Dr. Bennet first points out the treatment of simple inflammation of the neck of the womb; then of ulceration; and lastly, of ulceration with hypertrophy. "On glancing over the enumeration of the local means of treatment in simple inflammation of the neck of the uterus, and of its cavity, it will be seen that they consist principally in vaginal injections, hip-baths, local depletion, and the use of caustics." With regard to injections, Dr. Bennet has found cold water extremely useful as a powerful tonic and astringent; and states that it may be used with great benefit when the inflammation has been subdued. Of medicinal astringents, after many experimental essays, he has arrived at the conclusion "that alum is by far the most efficacious of all these agents, with the exception of nitrate of silver." He uses it in the proportion of a drachm to a pint. Injections alone Dr. Bennet has found powerless to subdue confirmed inflammation of the substance of the cervix, or of the mucous membrane by which the cavity is lined; but he has found them most useful in inflammations of a lesser degree.

"Not only is it possible to treat successfully non-ulcerated inflammation of the cervix, *when slight*, and of recent date, merely by emollient and astringent injections, rest, and attention to the general health, without having recourse to instrumental examination, or to means of treatment requiring instrumental interference, but even slight ulcerations, unaccompanied by general inflammatory hypertrophy, will sometimes give way under the influence of these means."

Much, however, of the success of this mode of treatment depends upon the manner in which it is carried out, and it is very clear that unless particular attention be paid to explain the proper mode of using injections, in nine cases of ten they will be perfectly useless.

"In order to derive full benefit from vaginal injections, they must be properly and efficiently used; and this is never the case unless the patient be previously instructed how to proceed. When a fluid is injected into the vagina, the patient being in a stooping position, not only does it at once escape from the parts, but it rarely reaches the cervix or the upper part of the vagina. For this to be insured, she should lie horizontally on her back, on the bed, on the sofa, or the floor, with the pelvis slightly elevated, so that the fluid may gravitate towards the internal structures. The natural contractility of the vagina expels the water, it is true, but not until it has well washed the entire vagina. A small quantity of the injection often remains imprisoned, as it were, in the superior cul de-sac of the vagina, in the the vicinity of the cervex, until the patient rises, when its own weight brings it away. . . . . The best instrument for vaginal injections is a pump-syringe, with a six inch elastic vaginal tube adapted to the longer tube, and presenting at its extremity, four or six small holes in the side as well as at the end. The vaginal tube can after introduction, be directed to the region of the vagina where the cervix lies, and any quantity of fluid can be injected without its being withdrawn."

Local depletion equally illustrates the importance of attention to what are generally considered the minor details of treatment. The application of leeches to the uterus is not a new practice, but this duty is usually committed to nurses. "It is too much the custom," Dr. Bennet observes, "to prescribe 'a course of leeching' as they would 'a course of medicine;' giving directions for leeches to be applied once or twice a week, for one, two, or more months, without ascertaining whether the continuance of depletion is necessary or not." These directions are given to the nurse, who is generally sufficiently intelligent to apply them within the vagina, but no more; hence the inflamed surface is generally omitted; and in order to obtain indirect relief, a larger quantity of blood is drawn from the vagina than is at all necessary. Besides this, the patient may be most unnecessarily exposed to a considerable amount of pain, because "the external surface of the cervix has very little sensibility, and when the leeches fix on it the patient experiences little or no pain. Generally speaking, indeed, she is only aware of their presence from the dragging sensation to which suction gives rise in the course of a few minutes. The cavity of the cervix, on the contrary, is *acutely sensitive*, and, if a leech fixes in it, the patient may experience most agonizing pain."

We quite agree, therefore, with Dr. Bennet, that this is a duty which should not be intrusted to a deputy. "In reality, it is very desirable that the practitioner should apply the leeches himself, if he can possibly afford leisure. The time employed need not be long, and he is thereby able to form an opinion on many points which will guide him as to their repetition, besides having an opportunity of making a very careful examination of the uterine organs." It is of the utmost importance that local depletion should be performed efficiently, and the greatest effect produced by the least loss of blood; and frequent application of leeches are highly detrimental, not only giving imperfect relief, but sometimes actually increasing the evil they were intended to remedy. "The application of leeches," says Dr. Bennet, "every week, or twice a week, for a lengthened period, appears to me sometimes to keep up a local congestion; thus tending rather to increas than to diminish the nutritive hypertrophy of the cervex and uterus, to which chronic inflammation gives rise." We fully accord our assent to this remark; as we believe every practitioner conversant with female complaints will do, when he recollects how temporary is the relief after successive depletions, and how often the returning pains are increased in severity. Local depletion is, indeed, too frequently of partial efficacy, and gives only temporary relief without curing the disease. *Cauterization* of the inflamed or ulcerated surface is essentially a new and most important principle in the treatment of these cases, and is that which has led to the greatest improvements in practice. But we also feel persuaded that it is that which may be the most easily abused, and may do mischief in proportion to its great power. Our author's observations on cauterization are most valuable; but none are more so than the cautions which he gives his readers, as to its occasional effect and its danger.

"It cannot be denied that cauterization of the cervix, as above described, and especially deep cauterization, is *an operation;* and like all operations, surrounded with danger. It must not, therefore, be either injudiciously resorted to, or carelessly carried out. Although my own practice has hitherto been free, or all but free, from serious accidents, the same immunity cannot always be expected. Indeed, I recently learned from M. Gendrin, that within the last few years he has had several cases of acute metritis, and of abscess in the lateral ligaments, the evident and immediate result of deep cauterization. But he also tells me he has seen the same results follow the use of nitrate of silver, and of injections; and I may mention that the two most severe instances of acute metritis that I have myself witnessed for some time, in the unimpregnated womb, occurred after the use of weak astringent vaginal injections."

While, therefore, this mode of treatment stands first on the list of remedies, because of its efficiency, it is also the most hazardous if incautiously employed; and requires, on the part of the practitioner, the most watchful attention, both as to the manner of using it, and to its subsequent effects, in order to render it perfectly successful. The caustics used are of various degrees of strength; nitrate of silver, pernitrate of mercury, nitric acid, potassa cum calce, potassa fusa, the actual cautery—all these have been employed to heal ulcers of the neck of the womb.

"The only caustic," our author observes, "that can be used with advantage in inflammation of the cervix, without ulceration or hypertrophy, is the nitrate of silver; which acts, however, more as an astringent than as a caustic. The solid nitrate of silver, or a strong solution, should be applied every three, four, or five days, to the inflamed mucous membrane covering the cervix. This is also the mode of treatment to which I have principally recourse, in the first instance, in inflammation of the cavity of the uterine neck, carrying the caustic into the cervical cavity, as far as it will pass."

When inflammation is accompanied with ulceration and hypertrophy, nitrate of silver may still be used; but, in Dr. Bennet's opinion, more powerful cauterization is often necessary.

"Ulceration existing on the cervix uteri, or within the cervical cavity, has a remarkable tendency to perpetuate itself indefinitely, notwithstanding the subdual of all acute or subacute inflammatory action. This tendency is no doubt increased by the periodical sanguineous congestion, to which menstruation physiologically exposes the inflamed tissues. Should it not yield (and it seldom does) to antiphlogistic means directed as above, the most efficacious treatment, indeed the only one that can be depended upon, is by direct stimulation of the diseased and ulcerated surface, to modify its vitality in such a manner as to induce a healthy action, and finally cicatrization.—This end is obtained by the use of caustics of varied strength, according to the nature and extent of the disease, its chronicity, and the effects obtained. In the application of these two principles resides the entire theory of the treatment of ulcerative inflammation, not only in the neck of the uterus, but in any other part of the economy. We must first subdue acute inflammatory action by emollients, depletion, and astringents, and then modify by direct stimulation the diseased surface, so as to substitute healthy reparative inflammation for morbid ulcerative inflammation.

Such are the principles of cauterization. Nitrate of silver is the least energetic of the caustics; the eschar is superficial, thrown off about the fourth day, and leaving a red, irritable, bleeding surface, which disappears on the fifth, when a more healthy ulceration may be observed. "When a solution of nitrate of silver is used, these effects are obtained in a shorter space of time, and it may consequently be applied at shorter intervals than every fifth or sixth day, the period which should be allowed to elapse between the application of the solid nitrate." This caustic has also the advantage of greater security, in consequence of its more limited cauterizing power; and so far from doing injury to the surrounding tissues, if it runs on and touches them, it acts on them beneficially as a powerful astringent, if they are at all inflamed. Nitrate of silver applied to the cervix externally causes no pain; but this is not the case when applied to the cavity of the cervix; nevertheless, although painful, it is not by any means so severe as a leech-bite. Nitrate of silver may also be used as subsidiary to the more powerful caustics, which can only be applied at more lengthened intervals—

"To rouse and modify more energetically the vitality of the diseased surface; and it is by the nitrate of silver that the new action thus created should be moderated and guided. Its occasional employment serves as a dressing to the ulcerated surface, prevents its becoming irritable and unhealthy, keeps down granulations, and thus powerfully assists in bringing about cicatrization."

Of the acid-caustics, Dr. Bennet prefers the penitrate of mercury, but cautions his readers against any carelessness in its application. "I have repeatedly seen," he says, "considerable temporary mischief occasioned by practitioners who were acting under my directions, the caustic having been allowed to run on the cervix and vagina, and thus produce extensive inflammation and ulceration." This is rather an objection to its use, besides that, although more powerful than nitrate of silver, its beneficial effect still limited; "the ulceration heals to a eertain point, and then cicatrization comes to a stand still." A more powerful caustic is therefore necessary, and this is supplied by potassa fussa. The application of potassa fusa to the treatment of intractable ulcerations of the neck of the uterus; and of chronic inflammatory hypertrophy of the cervix, is due to M. Gendrin, the eminent Paris physician; under him Dr. Bennet learned the value of this agent in controlling intractible ulcers. The rapid deliquessence of potassa fusa became, however, as great an objection, if not greater, to its use, than that of pernitrate of mercury. To meet this difficulty the Vienna paste, potassa cum calce, was used; but the mode of its application as a paste was attended with many inconveniences. Dr. Bennet varied in different ways its application; and after much pains has at length succeeded in obtaining a preparation that is as easily and as safely applied as nitrate of silver:

"In the last year or two, however, I have not once used either the Vienna paste or the pure hydrate of potash. I now always substitute cylinders of potassa cum calce, which, with the assistance of Mr. Squire, of Oxford street, I have succeeded in obtaining similar to those of nitrate of silver in ordinary use. M. Fihlos, of Paris, appears to have been the first to discover, some ten or twelve years ago, that it was possible to fuse potassa and lime in variable proportions, and to run the preparation into solid lead tubes. Not finding M. Fihlos' first tubes of fused potass and lime by any means as energetic or as efficacious as the Vienna paste or the hydrate of potass, I long used them only for superficial cauterization Some time ago, however, having received several from Paris, which were much more powerful, the proportions of potassa being greater,—two of potassa to one of lime,—I requested Mr. Squire to fuse these substances for me in the above proportions, and to run them into soft metal tubes. The fluid potassa invariably melting the tubes, we determined to have iron moulds of various sizes made, and to run it into these. I have thus obtained cylinders of potassa cum alce, which can be used with the greatest ease, and with perfect freedom from risk, owing to their not fusing as pure potassa does, *although quite as powerful in the effects they produce as is the latter substance itself.*"

The improved method of applying this powerful caustic, removes many of the objections to its use, and enables the practitioner to have the full benefit of potassa fusa with considerably diminished risk. Potassa fusa may be used either to modify the vitality of a diseased surface, in which case it is applied only for a few seconds; or to form an eschar of greater or less depth, when it must be applied for a longer time. "Severe cauterization should never be resorted to within less than twelve or fourteen days of the menstrual epoch, which it often slightly accelerates." The eschar disappears in about fourteen days, and the ulcer heals about the fortieth day; but if not, "the influence of the strong potassa-cauterization being exhausted it must either be repeated, or the treatment must be carried on with the milder caustics, if it is thought that they alone will suffice."

Dr. Bennet's observations on the treatment of hypertrophy and induration by cauterization are worthy of close attention. He very properly objects to the tedious and inefficient process of treating such a condition of the cervix by local depletions and local applications of iodine and mercurials. Their internal administration is of still less use. "I should myself as soon think of giving mercury and iodine to remove this chronic enlargement of the tonsils, as to remove hypertrophy confined to the neck of the uterus." Such a condition can only be removed by cauterization, which is prompt and efficacious, and which Dr Bennet has never found to fail. We are happy also to perceive that he cautions his readers against a misinterpretation of his views on this point; a mistake which, we confess, we almost fell into, when we read of the "melting influence of deep cauterization with potassa or the actual cautery." Knowing that it was the practice with some practitioners to use potassa fusa very freely, to reduce the hypertrophied cervix into shape—to melt it down, in fact, pretty much after the manner of a candle-end, with the cautery,—we feared Dr. Bennet was leading us into similar views of treatment, but we very happily found ourselves deceived.

"I wish it." says our author, "to be distinctly understood, that *I do not propose to destroy the hypertrophied cervix* by cauterization, but merely to set up an artificial eliminatory inflammation by means of an eschar or issue, of limited extent, established in the centre of the hypertrophied region. . . Any attempt to actually destroy the hypertrophy, by direct cauterization, appears to me both dangerous and unneccessary;—dangerous, because I should be afraid that the intensity of the reactional inflammation would be so great, as often to extend to the uterus or the lateral ligaments; and because I consider it impossible always to limit the action of the caustic when applied with such profusion;—unnecessary, because a mere eschar, the size of a shilling, will equally well answer the purpose of reducing the hypertrophy.';—*Brit. and Foreign Medico-Chirug. Review, Jan.* 1850, *p* .146.

144.—ON ENGORGEMENT OF THE UTERUS.—By M. RECAMIER.

At the Academy of Medicine, M. Recamier occupied nearly the whole *seance* with a discourse on engorgement of the uterus. As the views of the learned professor on this subject are rather peculiar, and his authority great, the following analysis may be acceptable. M. Recamier holds, that many cases of uterine engorgement are not merely inflammatory, but depend on a certain condition of that organ, which he denominates *erectile*. After having described at some length the erectile condition of the margin of the anus, so frequent in women, and accompanied by so much general disturbance, M. Recamier passed to the same condition as it affects the neck or mouth of the uterus.

It may occur at any period of life, but is most frequent after delivery. The tumefaction produced by the engorged vessels gives rise to an elasticity quite different from that of inflammation or scirrhus. It is seldom accompanied by fever though often so considerable that we cannot embrace the os tincæ within the speculum. The neck of the uterus is more or less painful, and discharges of a leucorrheal nature, or even hemorrhage, take place with more or less abundance. These local symptoms are soon attended by general disturbance. The patient labours under a great variety of dyspeptic or gastralgic derangements; nausea and vomiting, palpitations, headache, vertigo, numbness of the limbs, spasms, hysteric symptoms, and secondary inflammations of different kinds. Local hemorrhage soon causes anæmia, and, as the disease advances, vegetations may spring up from the deceased surface, or, bad constitutions, even carcinoma.

The progress of the disease may be rapid, or it may disappear, to recur under the influence of the cause which originally give rise to it. The constitutional symptoms give way with the local disease, and it is these variations which has given vogue to so many modes of treatment. Thus, in some cases, cauterization, or emollients, or calments, or derivatives, may succeed at a moment when other modes had failed; but this success should only teach us the necessity of being opropos in everything.

Erectile engorgement of the uterus, like the analogous disease of the rectum, is often chronic, and the patient remains in a cachectic state of suffering until relieved by art. The means of relief are various, and by turns successful; emollients and calmants in the drink; as liniments, injections, &c., together with rest and proper regimen. Local cauterization. Revulsives to the groins or loins. Tonics and preparations of iron. Excision; ligature.

For cauterization, M. Recamier prefers the nitrate of silver to the acid nitrate of mercury, because the former produces a drier eschar, and gives less pain. The solid caustic of Filhos presents many advantages; but we should reserve it for cases requiring a great destruction of parts. Many precautions are necessary during the use of this powerful caustic.

The ligature is required for fungous vegetations springing by a pedicle from a healthy surface. The ligature should always be tightened gradually to avoid the danger of peritonitis, which M. Recamier has seen produced by the opposite practice; or the vegetations may be removed by torsion, with a polypus forceps.

After having cited a great number of cases in support of the preceding doctrines, M. Recamier terminated his interesting lecture—for such it really was—by the following conclusions:—

1. There are certain engorgements of the uterus capable of being resolved, which are neither inflammatory nor connected with hypertrophy, scirrhus, tubercle, or fibrous tumours, but depend on elastic tumours, and ordinarily bleed as soon as the epithelium which covers them gives way.

2. These engorgements follow the same course as the anologous disease of the rectum.

3. They are of frequent occurrence; and when they have been established, never cease until *all* the erectile capillaries which compose them have been destroyed.—*Med. Times, Feb.* 16, 1850, *p.* 117.

145.—ON THE ORIGIN OF UTERINE DISEASE FROM OVARIAN EXCITEMENT.—*By* Dr. E. J. Tilt, Physician to the Farringdon General Dispensary.

The liability of the neck of the womb to disease, under the influence of ovarian irritation, will be better understood, if we consider its anatomical structure. The neck of the uterus is said to be constituted of muscular fibres, cellular tissue, and an external and an internal mucous membrane; but there is an other and very important element of its structure, which has been overlooked even in our best and most recent works on this subject,—I mean the *erectile tissue*, which also enters into its composition. Dr. Eugene Forget has lately asserted that the erectile tissue (a continuation of that which lines the vagina,) exists in the normal cervix; and that, as it forms a covering for the extremity of the penis, so it covers the surgical extremity of the neck of the womb.* It is evident, that the various stimuli to which the organ is liable, will exaggerate the condition of the normal structure which I have described, and thus give rise to those swellings, which are by some called inflammation, by others, engorgement; and which have been long since termed *erectile* tumours of the cervix uteri, by Prof. Recamier. The correctnes of this denomination will be evident, when we consider that these swellings are, at first, and often for a long time, of an indolent, spongy, vascular nature, and only inflame when, from the increased effect of irritating causes, their epithelial surface becomes abraded. The immediate therapeutical bearings of the erectile tissue, as one of the elements of the neck of the uterus, are important.—*London Journal, April,* 1850, *p.* 349.

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* Dr. Snow Beck denies the presence of any erectile tissue in the neck of the womb; and his intimate acquaintance with the structure of this organ gives weight to his assertion. I have, however, consulted our great microscopical authority, Mr. Quickett, who admits the existence of a layer of erectile tissue covering the neck of the uterus. He says that it is of a similar structure to that of the penis, and to that which lines the vaginia.

146—CASE OF HYDATIDS OF THE UTERUS.—By Dr. P. B. Hislop, Govan.

Mrs. A., aged 26, a lady of fair complexion and delicate frame, the mother of several healthy children.

For several months prior to this date, September, 1847, she has been losing flesh, and much annoyed with a profuse leucorrhœal discharge, which tonics and astringent injections have failed to rest,—has menstruated regularly, but profusely, till four months ago, when suppression of the function took place, and in its stead, frequent discharges of clotted blood or bloody serum have occurred at irregular intervals, and occasionally in rather profuse and exhausting quantities. She complains of frequent paroxysms of sickness, faintness, and feeling of exhaustion,—straitness and sense of weight across the chest, together with palpitation of the heart, loss of appetite and borborygmi—dragging pains in the back and loins, and feebleness of the lower extremity.

Above the pubis there can be readily felt, and accurately defined, a circumscribed swelling of the size of a well-developed uterus immediately after delivery; solid but not painful to the touch; of a regular and globular shape and rather mobile. This tumour has only recently attracted the notice of the patient, and she fancies it varies in size from time to time. On examination per vaginam the uterine orifice appeared *quite closed*, and no effort to introduce the finger was successful. The tumour in utero could be readily felt through the vaginal walls.

Patient assures me it is *impossible* she can be pregnant.

Failing, after the lapse of several weeks, to obtain any relief of the symptoms, and especially of the severe sanguineous discharge, from the use of mineral acids—the recumbent posture—gallic acid—iodine injections—plugging the vagina, and even ergot of rye, I resolved to take advantage of one of the capricious intervals of a cessation of the hemorrhage, to artifically dilate the os uteri, and make a manual examination of the uterine cavity, remove the cause of irritation and endeavour to bring about a healthy state of the utero-vaginal mucous membrane.

With this design, I prepared a series of sponge-tents, and taking one of a very small diameter, I, after no small difficulty, in consequence of a slight twist in the os uteri, in the direction of the sacrum, succeeded in introducing it partially within the orifice. This I repeated every twelve hours, each time employing a tent of increased diameter, causing in the first instance a considerable aggravation in the amount and fœtor of the sanguineous discharge, as well as some slight periodical pains.

At the termination of the fifth day I had accomplished the complete dilatation of the os uteri, bringing into view, through the speculum, a bulky bloody-tinged body, hanging pendulous from some part of the superior surface of the uterine cavity.

Having previously at intervals administered two cupfuls of a pretty strong infusion of ergot, I introduced my hand into the uterus on the 11th of October, and, guided by the morbid mass itself, sought its most elevated attachment, and cautiously detached it from the mucous surface of the uterus. This I repeated until I conceived I had removed the entire bulk from the uterus, which thereafter slowly, though *sparingly*, contracted on my hand, and on the following day could scarcely be felt.

A considerable hemorrhage took place both during and subsequent to the operation, which, from the debilitated and exhausted state of the patient, it was exceedingly desirable to obviate. I directed cold water cloths and warm flannel alternately to be applied locally. Repeated doses of the infus. secal. cornut during the day and subsequent night, and five-grain doses of gallic acid administered thrice a-day, were continued for upwards of a fortnight, when the coloured discharge had nearly ceased. Under this treatment, and a generous diet, she recovered slowly.

The masses removed in this case were very similar to those expelled in the first case,—a series of stringy bodies, like the fibrinous portion of a clot of blood, covered internally and externally with hosts of large and small hydatids.—*Monthly Journal April*, 1850, *p.* 327.

147.—ON THE DIAGNOSIS OF OVARIAN DROPSY.—By I. B. Brown, Esq.

[In a paper read before the Westminster Medical Society, Mr. Brown gave the following excelient account of the symptoms and diagnosis of ovarian dropsy. After referring to the peculiar expression of countenance which patients in this disease exhibit, and mentioning the little disturbance there is of digestion, respiration, or the heart's action, as compared with what occurs in ascites, Mr. Brown proceeds to say:]

The special signs are—First, we can generally trace the commencement of this disease from one of the ovaries deep down in the iliac fossa; a tumour pressing between the rectum and the vagina may be felt, either through the walls of the vagina or the rectum, not excessively painful, but elastic; on firmly pressing it, especially if at the commencement of the formation of the tumour, you can get it between the thumb in the rectum, and the middle finger in the vagina; but you can also frequently feel an egg-like enlargement around the ovary, through the abdominal parietes, especially if you flex the thighs on the abdomen, so as to relax the muscles. This tumour gradually and definitely increases, still maintaining a rounded outline, and ascends from the velvic cavity to the abdominal, and rises in the front of the bowels, distending the abdominal parietes, and sometimes reaches the ensiform cartilage, pressing up the liver, stomach, pancreas, and spleen, so as to elevate the diaphragm, and thus contract very considerably the thoracic space. This tumour, which, as it ascends, becomes more fluctuating, occupies the side from which it originates; but whilst it throughout retains a preponderance towards that side, it gradually extends to the opposite. The veins of the abdomen are generally much increased in number and size. The sac containing the fluid being circumscribed the indications afforded by percussion are also circumscribed, and the sounds on percussion are of course dull over the sac and resonant over the surrounding intestines. On examination per vaginam, fluctuation can be generally felt through its walls, and the vagina itself is elongated and drawn up, sometimes even under the arch of the pubis; the uterus is also either drawn up or pressed back on the rectum; the cyst is generally round and smooth on feeling it through the parietes of the abdomen, and moveable from side to side, and is not materially altered by change of position, either recumbent or upright. These special signs apply more particularly to unilocular ovarian dropsy. In multilocular, we almost invariably have an uneven and irregular surface of the cyst, and generally one or more solid tumours, which appear inelastic and without fluid; but in very many cases these tumours will be found to be additional cysts, containing fluid tense, owing to the pressure of the fluid, in the larger one. Mr. Brown had frequently found this to be the case; and this was proved by evacuating the contents of the larger cyst, and again introducing the trocar through the canula still in the opening, thrusting it into the apparently solid tumour, and finding immediately an escape of fluid. On examining a multilocular cyst, fluctuation is not very distinct, if you examine the entire cyst; but if you tap over any one of the sacs, fluctuation is apparent, but only over that one, not being at all communicated to the adjoining cyst or cysts; where, however, the fluid is gelatinous or albuminous, fluctuation cannot be so readily felt. The same observation applies to those cases contnaiing thick, cheesy matter, mixed with pus, and sometimes also with hair.

But we have also distinct solid tumours in connexion with these fluid ones; and then there is no sense of fluctuation. This observation applies both before and after evacuating the contents of the fluid cists. Having ascertained the nature of the tumour, so far as to say whether it is unilocular or multilocular, the next important subject is as to the presence of adhesions. In examining for adhesions, Mr. Brown directed that the patient should be laid in the horizontal posture, and be made to flex the thighs on the abdomen so as to relax the abdominal parietes; he then moved the cyst from side to side. If this were readily done, he knew there were no adhesions. Again, he placed his hand firmly on the relaxed parietes, and moved them over the cyst. If they moved readily, he knew there were no adhesions on the upper and lateral surfaces of the cyst. Again, as the parietes are thin in this disease, he grasped and puckered them up, and then moved them over the cyst, and also if they gathered up readily, without moving the cyst itself. If he found these three indications, Mr. Brown determined that there were no adhesions. Another plan, for which he was indebted to his friend, Dr. Sibson, is based on the extent to which the contents of the abdomen are forced downwards during a deep inspiration, by the descent of the diaphragm. If there be no adhesions in front, the upper boundary of the ovarian tumour descends to the extent of an inch during a deep inspiration, the place previously occupied by the tumour being now taken up by the intestines; consequently, if you percuss over the upper part of the tumour, a dull sound is elicited during ordinary respiration; but when the patient takes a deep inspiration, an intestinal resonance is there perceptible. Mr. Brown then alluded to those diseases which may be mistaken for ovarian dropsy, and slightly remarked on their peculiar signs. They were—1st, retroflexion and retroversion of the uterus; 2dly, tumours of the uterus; 3dly, cystic tumours of the abdomen; 4thly, ascites; 5thly, pregnancy; 6thly, distended bladder; 7thly, distended bowels from flatus; 8thly, fæces in the intestines; 9thly, diseased viscera of the abdomen.—*Lancet, Dec.* 1, 1849, *p.* 586.

148.—NEW OPERATION FOR OVARIAN DISEASE.—By I. B. Brown, Esq.

[At a recent meeting of the Westminster Medical Society, Mr. Brown gave an account of a new operation which he had performed for Ovarian disease.]

He observed that this operation differed materially from Mr. Bainbridge's, inasmuch as that performed by him required the patient to be in the prone posture for many months; whereas this enabled the patient to be on her back, on water cushions, which added very greatly to her comfort, and also enabled the nurse to dress and clean the wounds without fatigue or annoyance to the patient, as well as enabled the surgeon to apply pressure over the cyst, by placing strips of plaster from the opposite side of the abdomen, and bringing them firmly over beyond the incision and open wound. He placed the patient on the edge of the bed, in the horizontal posture, and then drawing an imaginary line from the umbilicus to the superior spinous process of the ilium, and dividing it into thirds, he made an oblique incision from above downwards, and from within outwards, through part of the middle third and into the outer third.

The oblique incision was about three inches. He dissected carefully through the muscles and fascia down to the peritoneum; through this could be seen the whitish shining coat of the cyst: he then made another smaller incision at right angles to the first, and dissected down to the peritoneum; this incision was about an inch and a half in length. At the point of the angle a large-sized trocar was introduced, and the fluid drawn off. The canula being kept in, the peritoneum was divided, and reflected back; then the cyst was stitched by sutures to the aponeurotic tendon of the external abdominal oblique muscle, carefully avoiding the other structures; these sutures were nine in number, and were so arranged as to secure completely the cyst on all sides to the tendon of the muscle, and prevent any escape of the fluid from the cyst into the peritoneal cavity; the canula was now withdrawn, and by means of a pair of scissors the cyst was divided between the sutures; a pledget of lint, soaked in oil, was then introduced into the wound, and changed occasionally, and some adhesive straps placed across the abdomen, to keep up gentle pressure. Not a single bad symptom, referrable to the operation, followed. The second operation was performed in a similar manner, and in the same position, but a piece of the cyst was cut out, the fluid being first evacuated, and then the remaining portion of the cyst was allowed to return to the peritoneal cavity, the external wound being closed; pressure was applied over the whole abdomen by means of adhesive strapping and flannel bandage. This operation was intended to imitate spontaneous rupture.—*Med. Gazette, Feb.* 8, 1850, *p.* 249.

142.—ON A METHOD OF PLUGGING THE VAGINA WITH A CAOUTCHOUC BLADDER.—By M. DIDAY.

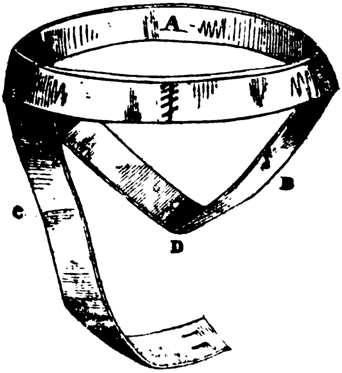
M. Diday, having a case of *metrorrhagia*, in which the patient had become reduced to almost the lowest point of exhaustion, resolved to avail himself of one of Dr. Gariel's ingenious applications of vulcanized caoutchouc. The apparatus consists of a small bladder of caoutchouc, to which is attached a long tube. Rolled up so as not to exceed the little finger in size, it was passed as deeply into the vagina as possible, and kept there by the end of the finger; it was then inflated through the tube, until the small body, which had been introduced almost imperceptibly, acquired a volume constituting a sphere of about 33 centimetres in diameter. The air was retained by tying the tube. No means of retaining it *in situ* were required, and the hemorrhage entirely ceasing, it was removed, sixty-four hours after, as easily as introduced, by allowing the air to escape through the tube.

Any one who is aware of the pain and uncertainty attending the ordinary mode of plugging the vagina, must agree with M. Diday that this is a most useful apparatus. Its advantages consist, he adds—1. In its simplicity, and the rapidity with which it may be employed. Thus, it only weighs about half an ounce, is soft and flexible, admitting of being put in the instrument-case, and is applied in a few seconds. 2. It causes no pain either during or after its application, and requires no bandage to retain it. 3. It admits, before insufflation, of being moulded on the parts to be compressed, and thus can exert compression upon a cavity, however irregular in form. 4. It allows of any degree of diminution or increase of pressure to be made, according to the exigencies of the case. 5 It is impermeable to, and incorruptible by, whatever discharges it comes into contact with, and never loses its elasticity. 6. Distended only to a third or fourth of its natural extensibility, it is just as smooth, and possesses nearly as great a resisting power, as when fully distended. 7. A somewhat larger apparatus would be available for plugging the cavity of the uterus itself, in hemorrhage after delivery. Moulded on the inner surface of that organ during its state of inertia, as this became recovered from, the air would be gradually let out, and the size of the compressing vessel diminished *pari passu* with that of the uterine cavity.

Dr. Gariel has availed himself of the remarkable properties of the vulcanized coutchouc (its unalterability by corrosives, its preservation of elasticity at all temperatures, its great strength, and its resumption of its original size after however great extension) for the construction of a vast variety of surgical apparatus, some of which exhibit great ingenuity. Thus there are bandages, means for making extension and counter-extension, means of exerting compression from within, as in stricture of the urethra, plugging the nares, plugging the vagina, pessaries, or from without, as in hernia, and other pads. One of the most simple of these is a portable urinal, which is of such a trifling size and weight, as to cause no inconvenience or ill appearance. The penis is adapted to the orifice of this just as the wrist is to the India-rubber band of a glove, and, the material being impermeable, no smell issues. When opportunity offers, without displacing the vessel, the patient discharges the collected urine by means of a little cock attached to it. ('Gaz. des Hopitaux;' 'Gaz. Méd.')—*Brit. and For. Review, Jan.*, 1850, *p.* 269.

160.—NEW BANDAGE FOR PROLAPSUS UTERI.—By T. W. Nunn, Esq., Surgeon to the Western Dispensary.

The diagram accompanying this communication is intended to be illustrative of a peculiar perineal bandage* which has been found useful in the treatment of prolapsus of the uterus. Its especial purpose is to enable the surgeon to afford support, or apply pressure to the soft parts forming the floor of the pelvis, according to the circumstances of the case.



A is a belt encircling the waist; *B* is a band attached obliquely to that point of the waist-belt which corresponds to the right hip, and is supposed to have passed between the legs, and to have been fixed on the corresponding point of the left hip by buttons or other means. *C* is another band exactly similar, having an opposite course, and an opposite attachment, that is to say, fixed to left hip, and after passing between the legs, fixed on the right one. The end which is intended to button is represented *free*, in order to render the diagram more easy to be understood; but it is not difficult to perceive that the two bands when properly adjusted will cross each other at the point *D*, or thereabouts. The bands must be attached to the waist-belt with such a degree of obliquity as will allow of their lying evenly in the corresponding groin when adjusted. The waist belt can be more or less shaped to the figure, as may be found most comfortable; but it is almost impossible to give precise instruction as to the exact form of every part, on account of the great diversity in the formation of the pelvis in different individuals. Sometimes it will be found requisite to make the bands *B* and *C* narrower at the point of crossing than at any other part—at other times this will be found unnecessary.

To insure satisfactory results from the adoption of this bandage, care must be taken to make every part fit exactly, and it is by attention to this point that the comfort of the patient is secured. In certain cases it may be found advisable to interpose a pad between the perineum and the bandage—this can be so easily effected that I deem it hardly requisite to offer any directions concerning it.

The advantage that this particular arrangement has over any of the other different modifications of the T bandage, is this—namely, it offers a perfectly steady unvarying amount of support—the tension upon its various parts being quite unaffected by the movements of the trunk. The reason of its possessing this advantage will be apparent, when it is taken into consideration that whilst the pressure is being made at the perineum, the *points d'appui* are at the margin of the ilium, and that, therefore, the distance between the point of pressure and the points of tension can neither increase nor diminish.—*Lancet*, *April* 6, 1850, *p*. 406.

[In a subsequent number of 'The Lancet,' Dr. G. P. May, of Malden, states that the bandage above described has been used for some time by Dr. Blundell.]—*Lancet*, *April* 13. 1850, *p*. 468.

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* Can be obtained of Mesdames Bell, 63 Margaret street, Cavendish-square.

151.—NEW UTERINE SUPPORTER.

[Mr. P. Mageniss recommends an instrument consisting of a small pessary supported upon a firm but flexible wire stem, which is attached to a frame of wire passing in front and behind, but so contrived as not to press upon the external parts and not to interfere with the evacuations. Straps pass up from the end of the frame in front and behind, and retain the whole in position by their attachment to shoulder straps, or to an abdominal belt.] —*Lancet, Dec.* 22, 1849, *p.* 661.

152.—NEW UTERINE SCARIFICATOR.

[At a meeting of the Westminster Medical Society, a few months ago,] Dr. Routh exhibited three uterine scarificators, made by Mr. Coxeter, of Grafton-street. Two of these, he remarked, were of little practical utility. Of the third, he believed he was the inventor, though it was founded on the principle of other instruments used abroad. It was to this instrument he wished, therefore, to call the attention of the society. It consisted of an external metallic case or tube, one end of which was dilated, to receive four lancets, concentrically arranged. The lancets were fastened upon a steel rod, which passed through the tube to the opposite side, connected within the case with a spiral spring, the effect of which was to keep the lancets, when in a state of rest, within the dilated part of the tube. The end of the steel rod projecting on the opposite side was terminated by a circular disc, between which and the tube was another little steel disc, playing on a screw, by which the projection of the lancets might be graduated. The difficulty was in keeping the lancets clean. This, however, was greatly facilitated by a peculiar arrangement in the central rod, which was so made as to unscrew in two parts, about two-thirds down the tube; and in this manner the upper portion could be drawn out and cleaned; while in like manner the tube, by the passing of a piece of lint within it, could be wiped. The quantity of blood, however, that penetrated down the tube was very trifling. In the application of the instrument, a speculum was first used, to bring the os and cervix in view; and the instrument, being passed up through the speculum, was thus brought in contact with the uterus. The slightest pressure now upwards, of the disc caused the lancets to penetrate into the substance of the cervix; while the spring, on the removal of this pressure, caused the lancets to return into the dilated tube; and in this manner, by the alternate movement, the cervix uteri could be punctured *ad libitum*, and to any depth. Now, congestion of the os, with all its disagreeable consequences, and prolonged cervix, causing vaginal irritation, metritis, &c., were very common affections. In these cases, he (Dr. Routh) was in the habit of first puncturing freely the cervix; but in prolonged cervix, where more hemorrhage and absorption of substance was required, in addition to the puncturing of the cervix, by turning the disc from left to right, he was enabled to cut it up in little portions. Then, by applying a solution of nitrate of silver (from twenty grains to one drachm to the ounce), much hemorrhage and great absorptive action was set up in the part, and the disease removed effectually. The use of leeches in the ordinary way, or caustic, were both tedious processes, and usually the former was especially disagreeable to a patient. With this instrument the cure was very speedy and effective. A prolonged cervix of from two to three inches could be cured in two weeks by two or three scarifications. Under these circumstances, he ventured to hope the instrument would be found useful, in the hands of the profession, for the treatment of uterine diseases. One caution, however, he thought proper to add—it was always well to follow the scarification by a brisk purgative.—*Med. Gazette, Jan.* 4, 1850, *p.* 34.

132.—ON THE USES OF OPIUM IN MIDWIFERY.—By Dr. J. C. W. Lever.

[Speaking first of the uses of opium in threatened abortion, Dr. Lever says:]

In the management of cases of threatened abortion, it is my rule, if possible, to get a thorough knowledge of the immediate or exciting cause of the hæmorrhage or pain, or both; secondly, before using opium, to ascertain the state of the os uteri, and especially whether the anterior part of the neck has lost its plumpness and firmness, and has become soft and baggy. If with the discharge we have a patent state of the os uteri, and if the neck be soft and loose, the exhibition of opium will do harm, by retarding the emptying of the uterus, which must sooner or later take place. But while I do not advocate the use of this drug under the circumstances related, I can speak loudly in its praise after the abortion has occurred, especially if such have been attended with a large loss of blood; it will allay excitement, tranquillize the circulation, and procure sleep. These remarks, however, do not altogether apply to those cases which menace from accident, or from mental causes, or those which may be said to be due to habit. In these, with the application of cold, perfect quietude, and unstimulating diet, I have known the exhibition of opium by mouth—or, what I prefer, a cold starch injection, with opium thrown into the bowel, and repeated every night or more often, according to existing circumstances—followed by the best results.

But the value of opium is still more clearly exhibited when it is administered to alleviate those pains which precede the establishment of labour in the latter weeks or months of gestation. Many a patient, by its agency has been carried on to the full end of her term, who but for it would have prematurely parted with her offspring. I had a lady under my care who, six weeks from the completion of her full term, fell on her back. The liquor amnii was evacuated. In addition to absolute quietude, she took opium at irregular intervals till the end of the ninth month, when a living child was born; and this to me was the more satisfactory as she had on two previous occasions been prematurely confined, although opium had been administered, but with a sparing hand.

Further, we find this drug of great value in certain varieties of natural labor. For instance, at the commencement, there may be irregular and spasmodic pains. They are recognized by their acuteness, by the want of consentaneous action of the uterine fibres; some portion of the uterus during their continuance, is hard and contracted, the other portion is soft and yielding; there is no distinct or regular interval of time between the occurrence of pain; and, if untreated or unrelieved, the strength of the patient is exhausted before the establishment of true labor pains; or the child, which at the commencement presented normally with the head, has its position changed to that of the shoulder, by reason of the uterus contracting on one side and forcing its contents over to the uncontracting or yielding side. In such a case the utility and value of opium is most marked. It may be exhibited by mouth or *per anum*. It will calm the spasm, subdue irregular action, alleviate pain, procure sleep; and after this, true and regular uterine action will be established. Manifold are the instances of its value I have witnessed in such cases.

Not unfrequently in women who marry late in life, and in those who marry very young, do we find the liquor amnii pass away very early—in fact, before the os uteri has commenced to dilate: this may occur spontaneously, or be the result of violence. At all times this is to be regretted; for, in addition to our losing the efficiency of the bag of water to prepare the way for the passage of the child, the fœtus is brought into close contact with the uterus, which is therefore more strongly stimulated; the head is brought into direct contact with the os internum, the most sensitive part of the uterus; the labor is more painful, and the birth of a living child is rendered more doubtful. Here the cautious and judicious exhibition of opium controls hyper-uterine action, alleviates pain, and gives a better security for the welfare of the child.

Again, in practice, we find women who have suffered in early or unmarried life from one of the forms of dysmenorrhœa, when pregnant and in labor, with the os uteri thin, sharp, knife-like, so that its edge is scarcely to be felt—in fact, is often overlooked by the unpractised finger. The sufferings of the patient are intense; the dilating stage of labor is protracted; and, if untreated or unrelieved, by the time the os uteri is dilated, nature is exhausted, uterine effort fails, and such a case is frequently terminated either by the forceps or by craniotomy. In most cases these evils may be averted by the timely employment of opium, and the best mode of securing its good office is in the form of enema.

Further, we occasionally find the first stage of labor rendered tedious by a hardened undilatable condition of the os uteri in women who have suffered from chronic inflammation of the neck of the uterus, or those who have worn mechanical contrivances for the purpose of supporting the viscus, and in those who, from disease imaginary or real, have been submitted to the influence of some escharotic at the present day by far too commonly practised. This condition of the os uteri needs no description; the sufferings of the patient are excessive and protracted, and, if unrelieved, may be followed by results serious to mother and fatal to child. In addition to blood-letting, applicable to some cases; to the warm bath, of immense value; to the exhibition of antimony, and this is of the greatest service; we find that when the latter has been exhibited, and has produced its desired results, relaxation of the os uteri, and increase of discharge, that opium given in a full dose will render such permanent, and thus prove a most valuable agent in completing a safe delivery. Opium has been recommended most strongly in cases where the os uteri is callous; but if the callosity depends upon previous injury, or is the result of disease, its value, in my opinion, depends upon its power to curb uterine action until vaginal interference removes the obstruction to the passage of the fœtus. But there is another condition of the os uteri in which opium acts, and like a charm: in women who have suffered from irritable uterus where the vagina is generally dry and hot, although not over sensitive; but the moment the examining finger touches the os uteri, the patient shrieks out, shrinks from the attendant, and by her cries and motions proves the suffering she endures. In addition to subsidiary measures, as the warm bath, the injection of linseed-tea into the vagina, great benefit is to be derived from the use of opium, either by the mouth or by the rectum; the latter mode of employment is the one I prefer.—Further, in cases of transverse presentation where it is necessary manually to interfere to bring the long axis of the child to correspond with the long axis of the uterus, we may assist in relaxing the os uteri, and abate uterine contraction, by the exhibition of a full opiate, but I am no advocate for repeated doses. By such treatment the patient becomes narcotized, uterine efforts arrested, and at the time we need contraction to complete the delivery and prevent hemorrhage, nature fails, and our patient is placed in a situation of extreme peril.

Again, in convulsions, especially those of the hysterical form, occurring as they do more frequently during pregnancy than during labor, opium is a valuable remedy. This form of convulsions, evidencing itself as it does most frequently during gestation, is readily recognised by the predisposition of the patient, often induced by over-fatigue, mental anxiety, irregularity in diet, &c., preceded by intolerance of noise, sleep short and interrupted, twitchings, startings, copious flow of limpid urine, oppression at the chest, difficulty of breathing, globus, pain at the upper part or back of the head; and when the convulsions manifest themselves the larger muscles are more often affected than the smaller; here we find after the paroxysm is over, that a mild opiate soothes the patient, allays the twitching, calms the respiration, and procures sound and refreshing sleep.

Secondly, in the anemic form of convulsions, associated as they not unfrequently are with large losses of blood, where the face is pale, the eyes glazy, the features shrunken, the countenance betokening exhaustion, the lips colorless, the skin cool, the chest heaving, the breathing labored, the pulse small, quick, and irritable, with noise in the ears, and pain or weight at the top of the head, where there is sleeplessness or restlessness, partial amaurosis, strabismus, and sometimes delirium: while close attention is paid to the position of the patient, especially to the position of the head; while stimulants are administered with judgment; while the contraction of the uterus is secured, opium will be found to act like a charm. Again, in genuine eclampsia, where vascular excitement and relaxation of the soft parts have been accomplished by bleeding, purgation, and tartarised antimony, and where the repetition of the fits seems to depend upon irritation, I have seen them occasionally checked by the administration of a full opiate. Labour also may be complicated with tumour; here opium will allay inordinate action until we employ those manual or surgical means which are necessary to remove the obstructing cause to delivery. It is true opium cannot take away the mechanical obstacle, but it may and will lessen inordinate uterine action; for in practice we find that if there be any difficulty in the passage of the child the uterus is stimulated to undue action, and if such be not allayed, or be overlooked, rupture of the viscus itself may take place. This leads me to speak of the efficacy of opium in the treatment of those grave cases where the uterus or vagina is lacerated, or the bladder or diaphragm have ruptured. The two latter lesions are indeed to be regarded as all but hopeless; but not the former, for I have seen cases treated by administration of full doses of opium, and then repeated at varying intervals for several days, and then terminating successfully. To one woman I was called when there was a band in the vagina the result of a previous delivery; in this case the laceration was so extensive that the hand could be passed into the abdomen. Although the patient appeared to be dying, although the last rites of her Church were administered to her, she rallied, recovered, and is still alive. Soon after her convalescence she had the ill fortune to lose her husband, but she also had the good fortune not again to be pregnant. But the value of opium is perhaps most emphatically demonstrated when exhibited after floodings, whether such occur in the earlier months of gestation, or in the latter, depending either upon the position of the placenta or its partial separation, whether the loss take place after the birth of the child and the casting or throwing off the placenta; whether this be retained by irregular contraction or morbid adhesion; or whether the hemorrhage take place after the complete evacuation of the uterus. In these cases, where there is great exhaustion, alarming syncope, great irritability, severe vomiting, and plain, evident, and undeniable indications of great depression of the sanguiferous and nervous systems, or to use the graphic language of Dr. W. Griffin, "When the countenance is sunk, the eye hollow and glassy, the lips blanched, the skin cold, and the whole person corpse-like; when the pulse is all but gone at the wrist; when the beat of the heart is scarcely perceptible, and stimulants, even brandy, are vomited or useless, opium will act like magic, and save the patient from an untimely grave: but to do good it must be exhibited in full doses of one or two drachms of the tincture, or three or four grains, repeating two grains every half hour or hour until the pulse becomes distinct, the breathing calm, and the jactitation allayed." Whatever may be the "ratio medendi," whether the congestion produced in the brain be what is necessary to maintain the proper tension of the cerebral vessels, whether it restore the loss of nervous power in the brain itself, is still a point "sub judice;" but no man of much obstetric experience will deny its value under the circumstances thus detailed. I could illustrate its efficiency by the recital of several cases of success where a patient appeared to be on the very confines of eternity; and in the subsequent constitutional treatment its exhibition must not be forgotten: it will lessen exhaustion, diminish restlessness, allay vomiting, calm gloomy forebodings, and procure sleep.—*Med. Gazette, Nov.* 23, 1849, *p.* 909.

154.—CASE IN WHICH PREMATURE LABOUR WAS INDUCED BY THE UTERINE DOUCHE. By Dr. O. Naegele.

Premature labour had, on two former occasions, been induced, in the subject of this case, with successful results, by means of the sponge-tent; but, on the first occasion, eighteen, and, on the second, seventeen days were required to accomplish it. Dr. Naegelé, therefore, on the present occasion, resolved to put into force the means proposed by Kirnsch, and simplified by Cohen. The termination of the labour was expected on the 15th of September, and he commenced the attempt to anticipate it on the 2d of August. The patient sat on a stool, with the upper part of her body bent somewhat backwards, the nozzle of a syringe containing 11 oz. of water at 27 R., was passed half an inch within the os uteri; and the water injected with considerable force eight times in succession. In the evening the injection was repeated seventeen times. She slept well, and early on the 3d, labour-pains having commenced, she was syringed out ten times. In the afternoon, the pains had become stronger and regular, and the os uteri was sufficiently open to allow the child's head being felt. Seven more injections were employed, the pains still increased in severity during the night, and, on the morning of the 4th, a living child was born, i. e., only forty-six hours after the first syringing. The placenta soon followed, and she did well. ('Medicin. Zeitung,' No. 36.)—*Brit. and For. Medico-Chirurg. Review, Jan.* 1850, *p.* 269.

155.—PROPHYLACTIC TREATMENT OF HABITUAL DISPOSITION TO ABORTION. By Dr. Metsch.

When the disposition to abortion is dependent upon a diminished vitality of the uterine system or functional weakness of its nutritive vessels, Dr. Metsch says that medicines of a stimulant and strengthening description, acting powerfully upon the circulation of the organ, are indicated, and of all such substances *savine* is that which is most to be relied upon for this end. Of course so powerful a drug requires skilful selection of appropriate cases for its employment, or it may give rise to hyperæmia of the pelvic and abdominal organs, inducing hemorrhage, inflammation, abortion, or death itself. Local or general plethora, or serious disease of any part contraindicate its use. An infusion is made by adding from two to four drachms to six ounces of boiling water, a spoonful being given morning and afternoon during the intervals between the menstrual periods. On several occasions, before commencing with it, catarrhal or gastric disturbances have to be allayed, as also irritation dependent upon congestion, rheumatism, or disorder of the nervous system. Small general or local bleedings, emetics, aperients, tepid baths, or friction of the surface are required in different cases. So too regulation of diet, abstinence from sexual excitement, rest in the horizontal position as long pain is present, are then indicated.

If the disposition to abortion depends upon an augmented irritability and contractility, (a condition not always opposed to the first named), the savine does not alone suffice, but a medicine is required that exerts a special effect in regularizing uterine irritability, the *ergot of rye*, which should be added to the savine infusion in the proportion of one to two, when former miscarriages were induced by the primary contraction of the womb without preliminary hemorrhage.

Another modification in the prophylaxis is to be made when former abortions were attended with great urinary irritation, in which case six drops of *tr.*

lyttæ should be added to each dose. When, prior to former abortions, there was great disturbance of the digestive organs, very small doses of *ipecac.* may be alternated with the above.

The savine has also been found useful in various chronic diseases of the female genital organs, connected with vascular and secretory torpor, especially in passive hemorrhages and leucorrhœa. In the same way it is of good service, conjoined with mechanical means, in treating prolapsus uteri consequent on frequent or difficult labours and abortions.—('Zeitschrift fur Geburtkunde.')

(Dr. Metsch speaks with great confidence of the great utility of savine, and relates some cases in proof; but it is obvious that such powerful medicines as savine and ergot require great discrimination in selecting appropriate cases. In these annoying cases of repeated miscarriage, occurring in women of weak and irritable fibre, and unaccompanied by vascular congestion, we have derived remarkable benefit from the administration of *assafœtida* as soon as a new pregnancy has manifested itself, and in the manner recommended by Dr. Lafierla of Malta. Ed.)—*Brit. and For. Review, April* 1850, *p.* 548.

156.—"OVULAR THEORY" OF MENSTRUATION.—By W. B. Kesteven, Esq.

[Mr. Kesteven's observations are directed to an examination of the grounds upon which rests the "ovular theory" of menstruation now so popular,—and not merely popular, but supported by high names, among which Mr. Kesteven mentions those of Drs. Power, Robert Lee, Meigs, Tyler Smith, and Kirkes.]

The ovular theory has been expressed in the following propositions:—

1. Previously to the period of puberty, the ovaria do not contain mature ova.

2. It is only at, and after the period of puberty, that ova are matured in the Graafian vesicles of the ovaries.

3. The maturation and discharge of ova occur periodically, *i. e.* at the time of menstruation.

4. The maturation and discharge of ova cease with the cessation of the catamenia.

5. The augmentation of the activity of the ovaria at these monthly periods is extended to the uterus. and produces the menstrual flow.

6. The menstrual flow is a secretion, the analogue of the decidua—"an abortive attempt to place the uterus in a position to receive and attach the ovum to its surface."

These propositions embrace the cardinal points of the ovular theory of menstruation. We propose, therefore, to examine them in detail.

Proposition 1.—"Previously to the period of puberty the ovaria do not contain mature ova."

On this remark, there exists no series of investigations, instituted with express reference to the ovular theory of menstruation, that can in any degree compete with the researches of Dr. Ritchie, as related in Vols. 33, 34, 35, of the 'London Medical Gazette.' On consulting these, we find the author recording the results of necroscopic examinations of the bodies of children of various ages, up to the period of menstruation, in the following words:—

"The ovaries of new-born infants and children are occupied, sometimes numerously, by Graafian vesicles or ovisacs, which are highly vascular as early as the sixth year, and vary in size from the bulk of a coriander seed to that of a small raisin, in the fourteenth year; at which time, also, they are filled with their usual transparent granular fluid; their contained ova can be detected, and their coats are so elastic, that their contents, on their rupture, may be projected to at least twelve inches."

The authority of Carus is cited in support of the ovular theory; but in the last edition of his 'System of Physiology,' this author states that he has found "the Graafian vesicles and *their contained ovules fully developed in the ovaria of children of three and four years of age.*"

Proposition 2.—"It is only at and after the period of puberty that ova are matured in the Graafian vesicles of the ovaries."

We may observe that it has not yet been shown that the decided and important change here indicated really occurs, as is implied, currently with the accession of the catamenia. Dr. Ritchie's dissections of the bodies of females in whom menstruation had existed regularly, and who had never been pregnant, show that no great modification of the condition of the ovaries from that preceding menstruation was regularly observed, beyond that a congested state of the ovaries is observed; but this state "does not necessarily give rise to any immediate modification in the manner in which the ovisacs are discharged, or in the subsequent changes which these bodies undergo."

"The progression of the Graafian follicles, or ovisacs, toward the surface of the ovaries, their appearance under the peritoneal coat as copper-coloured macules, the absorption of that membrane and their own tunics, and the occurrence of a solution of continuity at the point at which they unite, take place in the menstrual precisely as in the anti-menstrual life; but in the former the vesicles are increased in bulk, vascularity, and organization, so that in their rupture there is generally a greater lesion of the peritoneum, and after the escape of the ovulum and granular fluid a larger effusion of blood into the cavity, and more remarkable changes in the coats of the ruptured cysts, than in the non-menstrual state."

Proposition 3.—"The maturation of single ova occurs periodically, *i. e.* at the period of menstruation."

We have noticed that Dr. Ritchie's dissections have shown that the presence of menstruation is not necessary for the development or rupture of the ovisacs. It has already been observed, that menstruation may be present without rupture of vesicles; and also, on the other hand, that vesicles may be ruptured and ova discharged, before menstruation has occurred.

If the period of menstruation were the especial period of the maturation and discharge of ova, the latter should have been detected more frequently in the tubes or uterus, and more constantly after the period of menstruation than at any other time; but this is not the fact,—indeed the reverse obtains: while it may also be noticed that the number of the Graafian vesicles shows no relation to the number of the menstrual periods.

The occasional discovery of recently ruptured vesicles in persons dying during menstruation, as in the cases recorded by Dr. Power, Dr. Robert Lee, Dr. Negrier, and others, must be regarded as coincidences, until the relation of cause and effect can be closely traced. As ovulation is a constant function of the ovaries, and menstruation an occasional function of the uterus, the two may be expected to be found occasionally concurrent.

In the 'Medical Gazette,' Aug. 17, a case is reported from the 'American Journal of the Medical Sciences,' in which, on inspection of the body of a woman executed for murder, the ovaries were found in a state of congestion, with many vesicles approaching the surface. One vesicle was found ruptured, and containing a clot of blood, its inner tunic displaying great vascularity. Menstruation was just commencing. The internal surface of the uterus was coated with blood; its mucous lining congested, especially about the entrance of the tubes. The ovum was searched for, but could not be found in the tubes or uterus. The reporter, Dr. Michel, assumes that it was in the tube, but could not be found owing to the corrugated condition of the lining membrane of the latter. It may, however, justly be demanded that the discovery of this fact alone, in a sufficient number of instances, and with sufficient regularity, shall be received as the solid basis for this ovular theory of menstruation. What shall be regarded as sufficient regularity, may be left to be decided when the fact itself has once been established.

It is not without surprise, seeing the little ground that can be shown for this theory, that we find such an authority as Dr. Meigs thus asserting the assumed fact:—

"When a woman's body, who has perished while menstruating, or soon after the performance of that act, is examined by the anatomist, *he always* finds upon the surface of the ovaries a small bloody spot."

"A woman *never menstruates* without rupturing a Graafian vesicle and discharging an ovulum, and leaving a scar of the opened hila."

These essential facts are a total assumption, no facts in support of which have been offered, if we except the statement of Dr. Lee, that he never examined the body of a woman dying close upon the menstrual period, without finding a ruptured vesicle; whilst, on the other hand, it has been shown that they are not necessarily coincident, that they are only occasionally concurrent. Graafian vesicles are matured and ruptured during both lactation and pregnancy, when menstruation has been absent—a fact which argues strongly against the ovarian theory of menstruation.

As bearing upon the proposition under consideration, we may here cite a case recorded by Dr. Oldham in 'The Med. Gazette' July 13th. The last menstrual period occurred on Jan. 16th; sexual intercourse took place on the 28th Jan.; it had not taken place for several weeks before, and did not occur afterwards; therefore the woman was impregnated twelve days after menstruating. If the discharge of mature ova happen only at the menstrual period, conception must be limited to a day or two before, or to eight days after, menstruation; or the ovum would be washed away by the flow, and consequently this woman could not have become pregnant, as the date of impregnation is in this instance fixed.

Dr. Oldham here states that he has known cases where impregnation has occurred at the respective times of ten days, twelve days, and twenty-one days after the monthly period; and this is equally the experience of others, as well as that conception often precedes menstruation.

If the maturation occurred as the rule at the menstrual period, pregnancy would not occur so often as it does in the absence of the catamenia, as in the amenorrhœa of lactation and other conditions.

According to the Mosaic law, sexual intercourse is prohibited until after the eighth day after the appearance of the catamenia; to this the strict Jewesses add five days more, in obedience to a rabbinical precept; and yet these women are equally if not more prolific than other females. Then, if the ova be only discharged at the monthly periods, these individuals become pregnant before the discharge of the ova. But the rigid observance of these injunctions by a large number of Jewesses, coupled with the known experience of accoucheurs generally, that impregnation may and does take place immediately before the menstrual periods, affords a much stronger proof that the maturation of ova occurs at any time, than the occasional and infrequent observation of recently ruptured ovisacs concurrently with menstruation affords ovular cause of the menstrual flow.

The words of a writer in the 'British and Foreign Medico-Chirurgical Review' (vol. iii., p. 141,) are peculiarly expressive of the opinion now entertained:—"Passing by several minor considerations, there is this great practical anatomical difficulty to be yet overcome, which hitherto, we feel confident, has not been satisfactorily accomplished—viz., the presence of a true corpus luteum, when *we know*, from the fact of impregnation, than an ovum has been cast off; and the absence of any such body after the ordinary menstrual periods. We dot deny the spontaneous discharge of ova in the rabbit, sow, &c. &c., at the time of heat: or that this periodical oviposition is followed by luteal bodies in their ovaries; but we deny that any such bodies are to be seen in the ovaria of the human female as the simple result of menstruation. We have had ample opportunity of comparing the true corpora lutea, which have followed on conception in the female, with the vacated follicles or the extravasated blood which accompany the ovarian congestion of menstruation, and form false corpora lutea. But the two are in no notable particular alike; indded they are perfectly dissimilar; and, in our mind, it has yet to be shown that the human female is the subject of a periodical æstrum once a month, and that this time vesicles are maturated and an ovum discharged, which may be impregnated during its slow progress through the sexual organs, whenever it may come in contact with the semen."

It is often stated, in support of the assumption of the periodical æstrum in the human female, that women are more disposed to sexual intercourse at the menstrual period. We believe, however, that, independently of the moral control of delicacy, the very reverse obtains.

We may here, in reference to this proposition, appropriately quote the conclusions arrived at by Dr. Carpenter:—"It would appear, however, that although such a discharge takes place most frequently at the menstrual period, yet that the two occurrences are not necessarily coexistent."

The deliberate opinion of one who, like Dr. Carpenter, weighs his conclusions with the utmost care, goes nearer to truth than the bare assumptions of talent, however ingenious.

Proposition 4.—"The maturation and discharge of ova ceases with the cessation of menstruation."

Dr. Ritchie's examinations have established the fact, that the Graafian vesicles are formed in the ovaries "from the earliest periods of childhood to the most extreme old age."

The same author states that in old age their organization reverts to the condition of infancy; they even become of a light and fragile texture, resembling cobweb, the slightest pressure or exposure to the air causing them to give way and shed their contents. These observations correspond with the results of the investigations of others also. The proof to the contrary, therefore, rests with the theory-makers.

Propositson 5.—"The augmentation of activity in the ovaries at the monthly periods is extended to the uterus, and produces the menstrual flow."

For aught that has been demonstrated to the contrary, it may be more legitimately assumed that the increased vascular action of the uterus at the time of menstruation is extended to the ovaries, which are, in common with the uterus, the seat of an increased flow of blood at the same time. The extrusion of ova, it has already been said, may occur without menstruation, and the apertures on the ovaries left by ruptured Graafian vesicles may remain for three months after their discharge, menstruation recurring during the same time.

If the discharge of one or two mature ova in the human female be the efficient cause of the constitutional disturbance and discharge of menstrual fluid, it would *a fortiori*, be expected that the same thing should occur in the lower animals, in whom many ova are discharged. And although, as Muller observes, it sometimes occurs that the sexual heat of the lower animals, *e. g.* the horse and dog, is attended with a sanguineous discharge, this phenomenon is totally different from the regular menstrual flow in the human female, which has no connection with sexual excitement. The congestion of the ovaries at the time of menstruation stands more naturally, after a review of the preceding facts, rather in the relation of an effect than of a cause. It is a mere conjecture that this congestion causes the extrusion of an ovum, and that this discharge of the ovum causes the menstrual flow. The relation of causation is only admissible when the antecedent circumstances can be shown to have actually and invariably preceded the effect, to be adequate to its production, and to accord with all the circumstances. Such cannot be asserted in the case before us. It does not agree with the circumstances of this proposition, that in painful menstruation the symptoms are referrible to the uterine region; neither does it square with this theory that in prostitutes, in whom menstruation continues regularly, there shall nevertheless be found extensive disorganization of both ovaries.

It is surely only just that something more than unsupported assertions should be looked for, before the admission of a theory which is to revolutionize our entire views of the diseases and the disorders of the female sexual system. The mere ingenuity with which the several parts of a machine shall be put together, will not necessarily insure correctness in its working, unless these be adjusted with due reference to the motor principle. And here it appears that a complicated mechahism is constructed to work under the control of primum mobile, the existence of which is but yet a gratuitous assumption.

It is not hereby asserted that such relationship as is claimed for the congestion of the ovaries at the menstrual period cannot be, or that it positively is not; but it is simply required that proof thereof, hitherto wanting be adduced.

Proposition 6.—"The menstrual flow is a secretion analogous to the decidua."

A profound physiologist, whose researches constitute the greater portion of modern physiological science, states, "We are quite ignorant of the cause of menstruation." . . . . "The menstrual discharge differs from ordinary blood in no other respect than that of containing only a very small quantity of fibrin, or none at all. The blood corpuscles exist therein in their natural state."

All the analyses that have been made of catamenial fluid give as their general results, blood with epithelial scales, and mucus; the latter diluting it so as to diminish the proportion of fibrin. So far, therefore, as chemical analysis has been appealed to, it has furnished no reason for regarding it otherwise than as a hemorrhagic fluid, altered by the fluids of the surfaces over which it flows.

To assert that it is a secretion may square with a theory, but it remains still but a gratuitous assertion, not accordant with pathological phenomena, as a slight excess of the flow, or approach towards menorrhagia, is attended during menstruation with the discharge of *coagula*, showing that the blood is in greater proportion than the mucous fluids of the passages.

In the remarks that have been here submitted, the object has been to ascertain how far the ovular theory can be shewn to rest on facts. The reality of the hypothesis yet remains to be established. The admission of crude theories has in too many instances inflicted lasting injury upon medical science. Medical logicians should, therefore, be jealous in the admission of facts; still more should they be watchful over the employment of assertions, as facts, in the construction of theories. So far as the subject now under notice is concerned, *facts* do not constitute it other than a plausible and ingenious hypothesis, wanting in the true elements of an inductive theory—in short, an example of the *post ergo propter* line of argument.

The examination, then, of the so-called theory failing to exhibit the grounds of other than an ingenious hypothesis, the actual state of our knowledge of the nature of menstruation may be expressed in the following propositions; whence it will appear that the "ovular theory" has not added much to our previous information:—

1. Menstruation is a *periodical* function of the uterus.
2. Ovulation is the *constant* function of the ovaries.
3. Ova are matured in the ovaries at all ages, but more rapidly during menstrual life.
4. Ova are discharged at all periods of female life, in the intervals of, as at the time of menstruation.

the wants of the economy is lost as soon as anæsthesia commences, and the patient may then be asphyxiated by the absence of oxygen, without any sense of suffocation being experienced or manifested.

I still administer chloroform in four classes of cases. 1. In irregular but natural labour. 2. In operative labour. 3. To facilitate operations on the uterus. 4. To subdue uterine pain in dysmenorrhœa, &c.

I. In *natural labour*, I seldom resort to the inhalation of chloroform, unless it be occasionally to facilitate its last stage, or to allay some morbid conditions of the nervous and circulatory systems, which may be interfering with the progress of parturition. The pains of labour are sometimes partially arrested, diminished, or rendered irregular and inefficient, by fear, impatience, want of self-control, or by long continued suffering. When this is the case, chloroform generally exercises an all-but-magical effect. Under its influence all nervous excitement is soothed, the pains gradually become more regular, powerful, and efficient, and the labour once more progresses normally. This return of the labour pains, and their regularization under the calming influence exercised by chloroform on the brain, probably explains the increase in their intensity, noticed by some writers, on its first administration; and thus is explained the apparent discrepancy of different observers, on which so much stress is laid by the opponents to chloroform. If the pains are arrested or modified by nervous reaction, they return: if, on the contrary, they are too violent and prolonged, as is sometimes the case in the latter stages of parturition, when the soft parts are rigid and irritable, the intensity of the pains diminishes on the withdrawal of the excess of stimulation.

The disordered state of the circulation, and the congested condition of the capillaries, which are often observed in the cases to which I have alluded, also give way, in a most remarkable manner, to the calm produced by the inhalation of chloroform. This is so much the case, that since I have had recourse to it, I have never found it necessary to bleed from the arm during labour; the inhalation of chloroform having always been indirectly efficacious; even in some cases in which the cephalic congestion was so great as to make me fear convulsions.

Although I never hesitate, as will be perceived by the above remarks, to give chloroform in natural labour, whenever I think it may be of use, I do not urge my patients to take it, merely as a remedy for pain. If they wish to avoid the pangs of parturition, and are anxious to inhale chloroform (as I most certainly should, in their condition), I do not object to its administration. Firmly believing its careful inhalation to be innocuous to parturient women, I do not see how I can object; but I never press them to resort to it, not feeling called upon to interfere with a natural function, even to allay pain, if my patient be willing and able to bear it.

II. In *operative midwifery*, I continue to derive valuable assistance from chloroform. The cases in which I have resorted to its use, have been, exclusively, turning and retained placenta. In consultation and dispensary practice, the accoucheur occasionally meets with instances, in which the placenta has been retained for some hours, before he sees the patient. In these, and in the more difficult forms of turning, chloroform very much simplifies the operation, by rendering the patient unconscious of pain, and perhaps by slightly relaxing the rigidly-contracted uterus. In craniotomy, the pain inflicted on the mother is generally so slight and the duration of the operation is often so prolonged, that the inhalation of chloroform is scarcely, if at all, indicated. As I am also one of those accoucheurs who very seldom find the application of the forceps necessary, or even warranted, I have scarcely had an opportunity of judging as to the advisability of placing the patient under the influence of chloroform, prior to their use. I should, however, feel inclined to give a negative opinion, as either the maternal parts are sufficiently roomy to admit of their application without pain, or they are not; and, in the latter case, the danger of injury to the mother would only be increased by her unconsciousness.

I have only once had to contend with post-partum hemorrhage, after the administration of chloroform, during or after labor; and in the case in question, the patient, the wife of a medical practitioner, was labouring under disease of the heart, unknown either to her husband or to myself.

When administering chloroform in simple midwifery, I never give it to such an extent as to annihilate pain, but merely so as to allay or deaden it; in a word, I do not attempt to render the patient totally unconscious of her sufferings, but merely to render them bearable. In operative midwifery the anæsthesia must necessarily be pushed further, that is, to the surgical extent, as the intention is then both to render the patient unconscious of what is done, and to obtain the muscular relaxation, to which this stage of anæsthesia gives rise.

III. In *uterine examinations and operations*, chloroform is occasionally very useful to me; though, as a rule, no instrumental examination of the uterus need be painful, if an instrument proportioned to the degree of dilatability of the vaginal orifice be used, and proper gentleness be observed.—There are cases, however, in which the fears of the patient are so great, that the use of chloroform may be desirable; there are also cases in which the uterus, its neck, and even the vagina, are the seat of such intense neuralgic sensibility, that interference of any kind is all but impossible, unless the patient be under the influence of chloroform.

I have now under my care a case of this kind, a married lady, aged 26, who for the last four years has been a martyr to neuralgia of the most intense and agonizing description. The neuralgic affection has occupied principally the branches of the fifth pair, the nerves of the uterus, and occasionally those of other parts of the body, and has evidently been connected all along with extensive ulcerative disease of the cervix uteri. The uterine disease appears to have followed an abortion some years ago, and had been totally overlooked until she consulted me. The entire pharmacopœia had been ransacked, and the most powerful sedatives had been administered for years, without any favourable result. A careful digital examination of the uterus having brought on a frightful neuralgic attack which lasted a fortnight, I determined to put her under the influence of chloroform, and thus was able to bring to light a very extensive ulceration of the cervix. This organ was lacerated; and the seat of great inflammatory enlargement. I have now given this lady chloroform to the full surgical extent for fourteen consecutive weeks, that is fourteen times, and she has seldom taken less than half an ounce on a handkerchief, and sometimes more. I was very unwilling thus to continue its administration; but, until within the last week or two, she has never been able to bear the slightest interference whilst conscious, not even an injection of warm water. The disease, however, is now all but cured, and the morbid sensitiveness is fast disappearing. She has had no regular neuralgic attack for the last two months, and will evidently get quite well, both of the local disease and of the neuralgia which it occasioned. I have not been able to discover, in this patient's mental or general state, any detrimental effect whatever from this lengthened administration of chloroform. It occasionally gives rise to sickness, but that is all: nor does there appear to be any difference in her subsequent condition, whether she have taken much or liittle; the quantity inhaled in order to produce the same anæsthetic effect varies, without our being able to discover the cause. Sometimes she becomes insensible after a couple of minutes' inhalation; sometimes after eight or ten only. This case appears to me to prove the general inocuity of chloroform, even when taken in large doses and for a continuance. The last time it was administered, it was for the application of leeches to bring on menstruation, or to supply its deficiency, the menses being delayed to her great distress; and although she was kept under its influence for half-an-hour, there was even less subsequent distress from sickness than usual.

IV. In *uterine pain* from dysmenorrhœa, cauterisation, or from any other cause, chloroform continues to prove, in my hands, a valuable medicinal agent, either when given by inhalation, or internally as a medicine. It is, however, capricious in its action, and not to be depended upon in every case, especially when administered internally; its virtues as a sedative of pain are also much more decided when inhaled than when taken. The most propitious moment for inhalation with this view, but the most inconvenient to the medical practitioner, is at bed-time; it will often insure freedom from pain, and a night's rest, when every thing else fails. For this effect to be obtained, however, the patient must remain perfectly quiet on recovering consciousness; and this is the reason that night is so much preferable to day for inhalation. If the patient who has inhaled chloroform be once thoroughly roused, the sedative effect frequently passes away.

When given internally, twenty, thirty, or forty mimims of chloroform should be mixed with mucilage, or with the yolk of an egg, previous to water being added, so as to be held in suspension. If a little camphor be added to the chloroform, which soon dissolves it, the solution will also mingle with water.—*London Journal, March* 1850, *p.* 265.

[Dr. MURPHY, of University College, says:]

Chloroform is very volatile and very insoluble. as Dr. Snow has fully explained in his valuable monographs on the subject. Mr. Nunneley's experiments point out its local action. When applied to the skin, or any of the tissues, its immediate effect is, "to induce redness, some tumefaction and paralysis, with loss of feeling of the part which has been exposed to its influence." Bearing in mind these three facts, its action may be understood. The vapour of chloroform, diluted with atmospheric air according to the strength of the dose, when drawn into the lungs, is rapidly diffused over an immense extent of mucous surface, surrounded on all sides by innumerable blood-vessels and nervous fibrillæ. It first acts as a stimulant, exciting cough, hurried breathing, a sense of choking, cerebral excitement, and even convulsions; but this effect is almost instantly followed by the sedative influence of the vapour. When chloroform is perfectly pure, the stage of stimulation is scarcely noticed, being so rapidly succeeded by anæsthesia; but if impure, it is the reverse, which proves the importance of attending to the quality of the chloroform that is used, if we would wish to measure accurately its effects. In the lungs it is brought into immediate contact with the ultimate ramifications of the nerves and blood-vessels that surround the vesicles, and passing through these, it is taken into the pulmonary circulation.

Mr. Nunneley "is inclined to think the action is primarily in all cases, and principally, if not entirely upon the nerves;" and if so the sedative effect is instantly communicated to the cerebro-spinal axis, and from thence reflected over the whole of the sentient nerves. Such, however, is not the effect when locally applied elsewhere—the loss of sensation seems quite confined to the part, or to progress but slowly over the body; the extent of nervous surface exposed in the lungs, as compared with other parts, may, however, account for this difference. Dr. Snow has shown, by experiments very carefully conducted, that the vapor of chloroform is absorbed into the blood, and that the quantity absorbed bears a fixed proportion to that which is inhaled. He gives a formula, also, by which the quantity of this and other vapors contained in blood may be ascertained; and he proves that those fluids which are least soluble in the blood, and the most volatile, act with the greatest power. Chloroform possesses both these properties. It is very volatile, and is therefore rapidly diffused. It is only slightly soluble in the serum of blood, and consequently the blood dissolves much less than it absorbs. This will explain the rapidity of its action; because a certain portion, being free, is immediately conveyed from the lungs to the heart, and from thence throughout the whole circulation. It will also account for the slight change that takes place in the blood, in proportion to the effect produced. In surgical operations the color of the blood is unaltered. In animals that have been promptly killed by it, the lungs retain their scarlet color; nor is it until the respiration is impeded by the vapor, while the heart is acting and distending the lung, or that the animal is exposed a very long time to its influence, that we perceive any real change in the color or consistency of the blood. The rapidity with which its effects disappear may also be understood on the same principle. The moment that chloroform ceases to be inhaled, it quickly escapes from the circulation and is exhaled, leaving only a small portion behind to separate more slowly. In this respect chloroform differs essentially from alcohol, and may be contrasted with it. Alcohol being very soluble in blood, mixes with it freely, and circulates at the rate of the blood itself, hence it is comparatively slow in its operation; when inhaled, it produces little or no effect. We all know its effect when taken into the stomach—its powerful action as a stimulant, but having no anæsthetic effect, unless taken in large quantities. The two hydro-carbons may be placed side by side.

CHLOROFORM.	ALCOHOL.
Slightly soluble in serum.	Soluble to any extent.
Very slightly stimulating.	Highly stimulating.
A most powerful sedative even in small doses.	No sedative effect unless when taken in large quantities.
Its effects rapidly disappear.	Its effects continue for hours.
Most powerful when inhaled.	Least powerful when inhaled.
Comparatively slight effect when administered by the stomach.	Effect most powerful when taken into the stomach.
No alteration in the appearance of the brain in cases where it has caused death rapidly.	Apoplectic congestion of the brain, where it has been fatal.

Such are the differences in the effects of these fluids, and yet we are told that the insensibility of chloroform is only another term for intoxication. The amount of solubility in the blood seems to be a most important item in estimating the effect of anæsthetic agents. Their stimulant action appears to be in direct proportion to their solubility, their sedative power to be in inverse proportion. If we assume that a free undissolved portion of chloroform passes rapidly from the lungs to the heart, and thence throughout all the vessels of the body, its effects on the constitution may be understood. First on its arrival at the heart, a safe dose will only act as a stimnlant, or perhaps not at all. In some cases where the patient is previously excited by apprehension, and the heart, in consequence, pulsates rapidly, chloroform may reduce these pulsations by controlling the mental excitement; but this is very different from the slower and *feebler* beat that is the result of its sedative effect. This symptom is most important to attend to, because sudden death is the consequence if the heart's action be suspended—the syncope of chloroform is fatal; and if too concentrated a dose be inhaled. the excess of free chloroform may be so great as at once to paralyse it. The brain gives evidence of its effect in loss of consciousness, the medulla oblongata in slow deep stertorous respiration, the spinal marrow in more or less perfect loss of sensation and motion, and in the dying activity of reflex action. The different degrees of its influence on the vital functions have been fully pointed out by Dr. Snow; but that effect which has the most important relation to our present subject is the independence of sensation and consciousness. Mr. Nunneley observes, as the result of several experiments, that "the animal, after recovering from sopor, is often conscious long before there is any muscular power or even much sensation; indeed, after a moderate dose, or when the dose is not sufficient to induce a complete state of anæsthesia, consciousness remains where there is no power of motion and but little sensation, as everybody who has inhaled any of these substances knows." This effect has been frequently noticed by the writer, and seems to him to be one of its most valuable actions in obstetric practice. A moderate dose will diminish if not remove sensation, without destroying consciousness. The patient is afforded relief from the extreme intensity of her sufferings, without being put to sleep, and also by a dose of chloroform that may be given without the slighest risk. The reverse of this sometimes happens under more full doses—consciousness is lost, but sensation remains—a metaphysical difficulty certainly, but which, nevertheless, seems to be true. In one of the cases related, the patient complained of her back, placed her hand upon it, seemed to feel the full force of her pains, but, after her delivery, knew nothing about it—she said "she *felt* no pain." When death takes place, the influence of chloroform on the vital functions may be either progressive or simultaneous. Loss of sensation, motion, and consciousness, may be followed by stertorous, labored, feeble respiration, and this by the gradual cessation of the heart's action; or they may occur all at the same moment, the pulse, respiration, and consciousness, ceasing together. Hence the post-mortem appearances in man and the lower animals vary, and are influenced very much by the rapidity of the effect. After the most powerful doses the lungs are collapsed, the heart flaccid and empty, or the right side *moderately* distended by the cavæ, and the left ventricle contracted by the rigor-mortis; the brain is natural. But when death is less instantaneous the lungs are congested, ecchymosed, emphysematous; the right side of the heart and cave distended, sometimes enormously; the sinuses and membranes of the brain filled with blood.

[Dr. Murphy recommends that in ordinary cases of labour the dose of chloroform should be only very small; and herein consists, he observes, the safety of the practice. He says:]

In natural labour, the full anæsthetic influence of chloroform may certainly be safely induced, but it does not appear to the writer necessary to go at all so far. It seems to him sufficient to diminish the intensity of the pains. This may be accomplished without putting the patient to sleep, without even disturbing, in the least degree her self-possession; perfect consciousness may remain, and yet the agony of suffering be completely subdued; when chloroform is given for this purpose, the quantity is so small, that no interruption to the action of the uterus could be produced; whenever this has happened, the dose has been sufficient to soporise the patient, but even here such an effect was only temporary, and passed away with the cholorform, when the uterine contractions returned with more power and efficiency than before it was inhaled. In order to subdue the pains of natural labour, the writer generally pours about a drachm of chloroform on the sponge of a small inhaler. This is applied to the mouth alone, by which means atmospheric air is freely mixed with the chloroform, a certain portion passing into the mouth with the vapour, while the customary tract for respiration remains perfectly free. The quantity of chloroform really admitted into the lungs, diffused as it is in so large a quantity of air, must be very small—so small as not to excite the least sense of suffocation in its passage. If this quantity produce no effect, the dose is increased until it become sufficiently pungent to render the inhalation rather difficult. Its strength should always be tested before being given to the patient: a single inspiration will be sufficient to prove this. If the very moderate quantity first used should act with a power disproportioned to the dose; if it excite the patient, produce incoherency, or interfere with the action of the uterus, chloroform should be at once withdrawn. The time usually selected for its administration is in the second stage of labour, when the pains are increasing to their highest degree of intensity.

In operative midwifery, a more powerful dose is requisite. In such cases the writer prefers the inhaler of Dr Snow, by which the quantity of chloroform given can be accurately measured. When used by Dr. Simpson, or those who are perfectly conversant with the effects of chloroform, the handkerchief is certainly safe; besides, it is convenient and most efficient, but in the hands of the profession at large, it appears to the writer to be the most hazardous method of administration that can be employed. As a proof of this, it is sufficient to say, that in all the fatal cases reported, with two exceptions, chloroform was given on a handkerchief or cloth. Dr. Snow's inhaler being applied to the mouth and nose, inhalation is continual until sensation and consciousness are lost. If the patient become restless or incoherent, the dose must be increased, and a few inspirations will be sufficient to produce sopor. The moment that the desired effect is obtained, inhalation should be discontinued, and not again renewed until there is some evidence that the influence of chloroform is disappearing. It should then be repeated only at intervals, according as it is necessary to maintain the effect. The quantity of chloroform consumed in these cases is greater than in natural labours, but the time of inhalation is much shorter, and in this respect more resembles surgical operations, with this difference, that in obstetric operations the degree of anæsthesia need not be so great. The perfect stillness essential to the success of an operation where the scalpel is cutting its way through the very springs of life, is not required for midwifery practice.

The importance of using pure chloroform is alluded to by every writer who has paid any attention to the subject. Pure chloroform should contain no oxygen, and the more it approaches to chloric ether, and to the properties of alcohol, the more exciting it becomes. Hence it is probable, that in those cases where most excitement was manifested, the effect might be attributed to the impurity of the chloroform employed. On the other hand, it should be remembered, that perfectly pure chloroform is most prompt in producing its sedative effect, and therefore it should not be recklessly administered. When the quantity of chloroform inhaled is sufficient for the purpose, it may be known by observing the pulse, the respiration, the voluntary muscles, and the eye. The pulse—that may have been increased—becomes slower and *fuller*. The respiration also, is slower and deeper, as in sleep. The voluntary muscles have lost their power,—the arm drops. The eyes are inclined upwards; the pupil is sometimes dilated, but always contracts sluggishly. If the quantity is more than enough, the pulse may not only be slower, but *feebler*; a symptom which should never be passed over. The respiration becomes stertorous. In surgical operations this degree of narcotism is generally required, but it is not so in obstetric practice. Spasmodic contractions of the voluntary muscles may occur. As soon as the respiration becomes slow, deep, and regular, chloroform may be withdrawn, because its action will continue to increase for some time afterwards. If it should not do so, it can be renewed. By allowing sufficient time for chloroform to develope itself, and by ordinary attention to its effects, the practitioner can scarcely err in its administration.

The writer having given the subject of anæsthesia his best attention, he feels perfectly assured that chloroform neither impairs the contractile power of the uterus, nor injures in any way either the mother or the child; and that if ordinary caution be used, and if the administrator is conversant with the properties and effects of the agent he is employing, there is no risk whatever in the administration of chloroform. But at the same time it must be understood that these conditions are absolutely essential. The closest attention should be paid to the manner in which the influence of chloroform is developing itself, and equal care should be given to the quality of the chloroform that is used.—*Monthly Journal, Dec.* 1849, *p.* 1253.

[Dr. Waller, Professor of Midwifery at St. Thomas' Hospital, holds very different opinions from the preceding ones. His deductions on this subject are drawn less from his own experience, he tells us, than from the published experience of others. After remarking that the state of a parturient woman is very different from that of a person about to undergo a surgical operation, the former being usually one of health, the latter almost necessarily one of disease,—and that, therefore, the question of the use of anæsthetics in midwifery practice is quite distinct from that of their employment in surgical operations, Dr. Waller proceeds to say :]

In experiments upon animals I have noticed the three following results: first, agitation, amounting, in some cases, to convulsions; secondly, anæsthesia; thirdly, death, and this not preceded by any symptom indicating the approach of a fatal termination nor as a consequence of a long continued use of the chloroform. Can it with truth be asserted, that these results have only been witnessed in the inferior animals, and never observed in the human subject? Would that experience (the best of teachers) would warrant such a statement. The records of cases, published in our public journals, testify to the contrary, death has occurred after a very short inhalation, in some cases suddenly, in others preceded by convulsions. In my own practice, I have seen delirium produced of so violent a character as to render the patient for some time uncontrollable. In another case, a very "horrible feeling of oppression" about the præcordium was produced, attended with a feeling as though the "heart would burst;" then followed unconsciousness. On her reviving from this state, the lower extremities were paralysed to a considerable extent, and for the two following days this lady was unable to move about. This happened about two years ago, and from that period my patient informs me she has never been in perfect health. In two other instances the attempt at inhalation produced such a feeling of suffocation that it could not be persevered in. Two cases of death, one during, the other immediately following labour, have been reported to me; another wherein serious hemorrhage occurred. Dr. Montgomery states that in his own practice he has known the proper muscular action of the uterus for a time suspended.

I am fully aware that a ready, though somewhat flippant reply may be offered; it may be said these cases were exceptions to the general rule, or the remedy was improperly administered, or that a too powerful dose was employed. All this, to a certain extent, may be true, but still the practical difficulty remains.—I know that, where every reasonable precaution has been taken, hurtful and fatal consequences have followed, and this is sufficient to prevent *me* from employing these agents indiscriminately, and without a conscientious belief that of two evils I was choosing the least. Having proceeded thus far, it will scarcely be necessary to add, that in cases of strictly natural labour, where nothing is to be gained but unconsciousness of pain, and that at the risks before alluded to, I should never consider myself justified in making use of means which can only accomplish the object intended by reducing the patient to a state of mere organic existence by paralysing those portions of the brain from whence the nerves of sensation and voluntary motion derive their influence; and especially since the fact is well established, that occasionally the nerves of respiration and circulation are alike paralysed, when death must inevitably ensue.

It is extremely difficult to determine with precision what is the effect of this narcotism upon the action of the uterus. If we could credit the accounts which have been published from time to time, the following conclusion must necessarily follow: that the system generally, and the parturient organs locally, are made so remarkably tractable, that they accommodate themselves to the exigencies of the peculiar case, and to the wishes of the practitioner. Thus we are told, that under the use of chloroform the most opposite effects have been produced; in the one instance it will contract, in another it will relax! in a third, where everything is going on favourably, no special action ensues. The inhalation is, therefore, proper, whether we wish to expedite labour, to prevent hemorrhage, or to render the uterus quiet for the purpose of introducing the hand in cases of difficult turning. Again, it has been said that perfect insensibility on the part of the patient is a great boon to the practitioner in cases of instrumental midwifery, inasmuch as the operation is unattended with pain, and no sudden movement of the female will obstruct the progress of the delivery. During an extensive midwifery practice of nearly thirty years, I do not recollect ever to have been resisted by these movements except once, whilst on the other hand I cannot but consider that perfect susceptibility to pain may sometimes prevent the infliction of serious injury upon the maternal soft parts. The teachers of midwifery should remember, however simple and easy obstetric operations have become to them in consequence of their frequent performance, that their recommendations and opinions will influence the practice of those who have not, and never can have the same opportunities; and that what may be perfectly safe in the hands of the few, may not be equally so in the hands of the many.

As regards myself I have a very decided objection to the use of chloroform in instrumental midwifery, especially where craniotomy is performed in the more aggravated cases of pelvic deformity, where it often happens that a rough edge of the fœtal bone comes into contact with the soft parts of the mother, and to which the attention of the practitioner is probably first directed by a complaint that "something is scratching." I must not, however, forget that the production of anæsthesia is destined to explode that barbarous operation, and that henceforth patients, whose cases require craniotomy, are to be placed under the influence of chloroform, the infant turned, and violently dragged through the contracted pelvis; as if, with the loss of sensation, there would be no danger of injuring the soft parts by the exercise of any degree of force necessary for the accomplishment of the desired object!!

From the foregoing observations the following conclusions may be fairly deduced:—

1st. That the inhalation of ether and chloroform has been followed by injurious and fatal results.

2d. That in natural labours no reason exists for the employment of a remedy, the efficacy of which is at least doubtful, and its action often hurtful.

3d. That the action of the uterus is sometimes suspended; but the published accounts are so contradictory, that it is impossible to form an accurate judgment on this point.

4th. That the production of anæsthesia in operative midwifery is likely to be injurious rather than beneficial.

I will merely add, in conclusion, that the only cases which appear to justify inhalation are the following:—

1. Where there is an unusual degree of nervous excitability and sensitiveness. I should, however, not be inclined to produce perfect insensibility, but should be satisfied with *diminishing* the powers of sensation.

2d. Where there are severe muscular pains in the neighbourhood of the uterus, interfering with its action. This state has been well described by Dr. Power under the generic term "myopathia," of which he describes several varieties. In these cases I should recommend moderate inhalation, and not the production of perfect narcotism.

3d. In very dfficult cases of turning, some benefit might *possibly* be obtained, although in many instances, a dangerous amount of force might (unless great care be taken) be employed in extracting the child when the patient is in a state of insensibility.—*Med. Times, Nov.* 10, 1849, *p.* 375.

[Dr. TYLER SMITH has experimented in various ways to test the peculiar aciton of chloroform, if any, on the uterus, and gives us his opinions deduced from these experiments, as follows:]

The increased uterine action observed under the administration of chloroform in natural parturition, would appear to be analogous to the increase of the spinal function on the first inhalation of this agent. A thousand facts in obstetrics testify most irrefragably to the influence of the spinal marrow, and of the reflex function, in parturition. That, under the influence of chloroform, stimulation of the spinal marrow is observed in the first instance, appears to be proved experimentally. In human labour, the motor influence of chloroform may be also increased by mental emotion, at the instants of passing into, and escaping from, anæsthesia. In some cases, when the anæsthetic is used in great moderation, its effects, however long continued, may, perhaps, be simply stimulant.

Where the motor pains of labour are rendered less vigorous by chloroform, we may infer that it is because the function of the spinal marrow, particularly of its lower portions, is enfeebled by chloroform, as in the experiments in which the reflex actions were so much reduced in power. The uterus and the parturient functions are left chiefly to the peristaltic action of the organ.

But we know, that under these circumstances, delivery nevertheless takes place. The pains may appear weaker, but the child is expelled in many cases, without any unusual delay, and, in others, after labours of very tardy progress. In many cases where the labour is completed within the common period, labour is said not to be interfered with by chloroform, though in reality it may be to a very considerable extent.

It has been mentioned, that in deep chloroformization, the sphincteric orifices of the pelvic viscera are relaxed. In the use of chloroform in labour, it is universally maintained, that unusual relaxation of the vagina and perineum is produced. This is naturally explained by the diminished energy of the spinal function. The vagina, the muscles of the perineum, and of the floor of the pelvis, lose some of that reflex power which affects all muscles, and by virtue of which they resist the passage of the fœtus, until full dilatation has been performed by the gradual advance of ordinary labour. Thus, though in the use of chloroform in labour, a power of expulsion is taken away, a power of resistance is at the same time withdrawn. In the balance of the two, labour proceeds, and, in some cases even more rapidly than usual; in others, again, the process is very tardy or impossible. As already observed, chloroform does not commonly dilate the sphincters when given in labour, or in operations, to such an extent as to cause the escape of the contents of the bowels and bladder; but it does so when given in excess. In the relaxation of the parturient passages in labour, the dilatation, though partial, is still sufficient to render labour performable, by a less exercise of motor force than usual. The existence of dilatation is at once an indication of the presence, and a measure of the extent of the failure of the spinal motor powers in parturition.

It has been seen experimentally, that the peristaltic action of the uterus continues vigorous after the total annihilation of the direct and reflex action of the spinal system. It is this power which effects delivery, in some cases, in the human subject in paraplegia, and even after death, when at least the actions of respiration, and of the heart, have entirely ceased. In cases of labour proceeding under the influence of chloroform, when the anæsthetic is pushed to the extent of enfeebling the spinal function, it is, as I believe, the peristaltic action of the uterus which, in the great majority of cases, is then the principal agent in delivery.

Thus, in anæsthetic midwifery, the natural arrangement of the motor powers appears to be modified in the following manner. The reflex function, as concerned in parturition, is affected in two modes. 1. The reflex actions are weakened, so that the impression of the advancing fœtus upon the excitor nerves of the parturient canal, does not excite their wonted reflex actions to the same extent as usual. The spinal *contractions* are below the average. 2. On the other hand, all the parts concerned in the dilatation of the parturient passage and outlet, are in a state of relaxation, depending upon the condition of the spinal function. The spinal *dilatations* are increased by the influence of the chloroform. While this state of things obtains, the peristaltic action depending upon the ganglionic system remains in the ordinary state of activity, and in the relaxed state of the passages, is sufficient in many cases to effect the delivery of the fœtus, without any unusual delay. This dilatation of the parturient canal also exists in certain cases of paraplegia, and even after death; so that the occurrence of delivery, during profound anæsthesia—the occurrence of delivery, in some cases, in experiments in which the lower portion of the spinal marrow is injured or destroyed—the occurrence of delivery in the dead subject,—are no proofs whatever that the spinal marrow is not actively concerned in natural parturition, or that peristaltic action is the sole power by which the fœtus is expelled in natural labour in the human female, where the dilatation of the parturient canal is commonly a painful process.

Delivery under chloroform, appears, then, to be a patholigical condition, in which, as regards the motor actions a state of artificial dilatation compensates, in some degree, for the deficiency of expulsive power. From these data, as it appears to me, we must survey the motor derangements which are declared sometimes to occur in the practice of chloroform.

The facts relating to the destruction of the spinal functions, including the respiratory function, tend to show, that in the treatment of persons dangerously affected by chloroform, the attempt to excite artificial respiration alone is not likely to be attended with success; but that the peristaltic action of the heart should be kept up by galvanism, and other direct stimuli, until, if possible, the poison shall have been eliminated from the spinal system. It appears evident, that after the reflex movements of respiration have ceased, the heart may still act; and to this organ attention should, I think, be chiefly directed in the attempts at resuscitation in accidental poisoning by chloroform.

The experiments detailed, furnish some important obstetric hints of a practical nature. It has been recommended by the advocates of anæsthesia, that the ergot of rye should be given with chloroform, in certain cases, in order to strengthen the actions of the uterus in tardy labors. A little consideration will show, however, that the ergot is not likely to be serviceable in uterine inertia, complicated with chloroformization. There can be no doubt that the ergot itself acts as a spinal excitant, sometimes even producing general tetanic movements in the limbs of the parturient woman. It is little better than a contradiction, to give a spinal *stimulant* and a spinal *sedative*, at one and the same time. The true indication in this form of inertia would be, to stimulate the peristaltic action of the uterus by galvanism, or by direct mechanical irritation. The appeal should be made, not to the spinal function—at least not while the influence of the anæsthetic continues—but to the peristaltic action of the uterus, which remains unimpaired by the chloroform, after the spinal function has been enfeebled.

In uterine hemorrhage after delivery, occurring under the use of chloroform, the knowledge of the peculiar way in which this agent affects the the nervous system, supplies important indications of treatment. Reliance should not be placed upon the administration of ergot, or the excitation of uterine reflex action by cold or other means; but on mechanical pressure, the galvanic stimulus applied to the uterus, and direct mechanical stimulation of the organ. In the arrest of uterine hemorrhage under chloroform, there can be little doubt, that we have the serious disadvantage of the loss of one of the most efficient motor powers for its arrest. Similar considerations also apply to those labors and obstetric operations, in which a diminution of the motor force of the uterus is of temporary advantage, and in which a safe and manageable sedative of the utero-spinal action would be an invaluable boon; but to enter fully upon these matters on the present occasion, would occupy more space and time than I can either claim or afford.

The principal conclusion deducible from the experiments detailed in the present paper, and warranted by the experience of chloroform in midwifery, upon which I would insist, is this,—that chloroform enfeebles the action of the spinal marrow and the reflex function, *pro tanto*, according to the profoundness of the anæsthesia induced, but that it leaves the peristaltic actions little, if at all, affected, so long as life continues. Besides the influence of volition and emotion, the action of the uterus in *parturition* is both *reflex* and *peristaltic*; the peristaltic action being, as I have insisted, in my work on 'Parturition and obstetrics,' "the basis of the other uterine actions,"—"the basis or radical element upon which the other causes of motor action operate;" and I quote these words to show that I have not underrated the importance of uterine peristaltic action. Setting aside natural labor, abnormal parturition may be divided into two great classes.—1. Parturition with diminised motor action. 2. Parturition with excessive motor action. The study of the relation of chloroform to these two classes of difficult labor, and to the different forms of motor power concerned in natural and difficult parturition, is scarcely less important than its study as an anæsthetic. I have attempted to supply the indications according to which this study should be pursued.—*London Journal, Dec.*, 1849, *p.* 1111.

ADDENDA.

160.—ON THE USE OF TANNIC ACID IN VARIOUS DISEASES.—By Dr. S. Scott Alison, London.

[Dr. Alison has found tannic acid extremely useful in many diseases. He makes the following observations respecting its employment; and first, as an astringent, for which purpose Dr. A. thinks it equal to any agent, whether vegetable or mineral, that he has ever employed.]

Internal use. In the *chronic bronchial catarrh* of weakly and elderly persons, unconnected with disease of the heart or great blood-vessels, and attended with copious and debilitating expectoration, the administration of tannic acid by the mouth, in doses of one, two, and three grains, two or three times daily, has greatly and gradually abated the secretion, relieved the frequent cough, and improved the strength of the patient. In the second stage of *pulmonary consumption*, viz., that of softening, when bronchial catarrh has been present to a large extent, weakening the patient, causing frequent cough, and disturbing sleep, the same results have followed, and have greatly contributed to the comfort and welfare of the sufferer. But in pulmonary disease, the greatest amount of benefit has obviously been derived when large cavities have been present in the lungs, the walls of which have thrown out large quantities of purulent matter, occasionally mixed with blood. In such cases, the discharge has been effectually controlled, and the rate of tear and wear of the system obviously restrained, without the induction of oppression or other evils.

In *chronic diarrhœa*, which had resisted the ordinary treatment of chalk, opium, and regulated diet, and was not dependent on obstructive disease of the heart or liver, tannic acid, in a solid form, has proved of surprising efficacy. In cases of severe disease, depending on an irritable weakly mucous membrane, I have not known of one failure; and of those examples connected with chronic inflammation and disorganization of the mucous membrane, only two proved beyond the influence of this remedy. These two cases occurred during the last autumn, while cholera was present; and the disease of the mucous membrane was extensive. The complaint in one of the examples was of long standing, and the patient had been addicted to habits of intemperance. But it was not tannic acid only that failed; the salts of copper, iron, lead, and zinc, in large doses, proved to be of no more avail. In this form of disease, tannic acid was administered in the form of pill, in combination with opium.

In *leucorrhœa*, unconnected with inflammatory action, I have found tannic acid efficacious in restraining the discharge, and in increasing the strength of the patient. The aqueous solution, combined with a small proportion of dilute nitric acid, was the form usually employed in these examples of disease. In *menorrhagia*, not dependent on a plethoric state of the system, or on local congestion, it was also serviceable, and administered in the same form.

The excessive *sweating in phthisis*, and in other diseases running on to a fatal termination, has been usefully restrained by the use of tannic acid, combined with dilute nitric acid; and the habitual cold damp upon the skin of soft, weakly constitutions has been corrected by the same means. I have had no opportunity of testing the virtues of this remedy in the *hemorrhagic diathesis*; but I am strongly disposed to believe they would be found very considerable, conjoined with other suitable means. I believe it would prove serviceable in *albuminuria*, dependent on chronic disorganization of the kidney, and not associated with obstructive disease. When the egress of albumen results, as I believe it often does in no small degree, from reduced tone and elasticity in the organ, and is not (as in a great majority of cases) a wholesome outlet necessary for the relief of the circulation, tannic acid offers the promise of benefit. Such a case, however, I have not lately met with, and consequently have not had an opportunity of testing the treatment.

Local application. In the form of aqueous solution, used as a gargle, tannic acid has been most useful in correcting relaxtion of the throat. Sponginess and hemorrhage of the gums have been greatly controlled by a lotion of tannic acid, and by the application of the dry powder. By this means, loose teeth may be retained for a time, and the impediment to articulation thereby prevented, which would result from their removal.

In *prolapsus ani* I have prescribed tannic acid, dissolved in water, as an injection. This remedy is particularly indicated, when the disease is associated with great relaxation of the solids. Applied to *hemorrhoidal tumours*, free from inflammation, in the form of a fine powder, mixed with lard, it would doubtless prove more efficacious than galls, the usual remedy. It is assuredly due to the tannic acid which it contains, that uva ursi proves serviceable in *catarrhus vesicæ*.

In *gonorrhœa*, chronic or about to become such, tannic acid, applied externally as a lotion, has proved serviceable. In the latter mode, it has induced no smarting, although the parts have been tender, and though it has been applied with little intermission for several days. It is as a local astringent that tannic acid produces the most obvious effects, as Dr. Garrod has remarked.

Of tannic acid as an astringent, I have merely further to say, that it is of special excellence as an external application to the skin, when such a remedy is required. I have found it of extraordinary efficacy, when reduced to fine powder, mixed with lard, and applied to the skin. The parts soon acquire a healthy aspect; very little of the smarting or pungency is experienced, which so generally results from the use of the salts of alumina, lead, zinc, or copper. I have found it far superior to gallic acid.

2. As a *Peptic*, tannic acid is very efficacious. This I soon found, while employing it as a pure astringent. Symptoms of dyspepsia disappeared under its use, the appetite increased, flatus and sense of distension were abated at the same time: and, in several instances, the bowels, far from becoming constipated, acquiring a more healthy tone, actually became more free. A lady affected with phthisis, who has been under my care for three years, during which time she has taken tannic acid alternately with cod-liver oil, complained, very lately, of loss of appetite while taking the oil. The morning dose of the oil was replaced by tannic acid, combined with dilute nitric acid; and the result was a very striking restoration of the appetite. With such obvious improvement in the condition and action

of the stomach, it is reasonable to believe, that one of the results is the formation of a more perfect chyle. The action, as a peptic, is in accordance with the statement of one of the best writers on Materia Medica. Dr. Pereira says, " Administered in moderate does, they (astringents) promote the appetite, assist digestion," &c.

3. As a *Histogenetic*, in *promoting the genesis*, and in *improving the quality of the blood*, tannic acid, it may be inferred from what has been stated above, would probably effective. But that it is really so, I have the evidence of improved complexion, greater fulness of the blood-vessels, increase of strength buoyancy of spirits, and improved secretions, in numerous examples of anæmic and other diseases, in which this agent has been long employed.

The *formation of structures in the young*, I have reason to believe, is subserved, to a valuable extent, by the long-continued administration of tannic acid, in moderate doses. It is nearly six years since I began to prescribe this remedy in cases of curvature of the bones in children, with soft shafts and enlarged epiphyses. The number of cases placed under this treatment, while I was physician to the Northern Dispensary, was considerable; and not a few occurring in private practice were similarly treated. The general health was improved in all. The secretions, in many cases exceeding offensive, were greatly corrected. In the course of a year or two, an obvious improvement in the shape and form of the bones was manifest. The curve was reduced; and the heads of the bones had lost no small amount of their disproportionate prominence. I have lately seen two or three children, presenting no appearance of having suffered from this affection of the bones, who, some years ago, really were deformed, and who were put under the influence of tannic acid, and also, it is true, of suitable regimen. In most of these examples of disease, when they came under my care, the urine contained an undue proportion of lime. This continued to be the case, at least for some time, even under the use of tannic acid, though perhaps not to the same extent. If tannic acid really possess the power of correcting the tendency to rickets, or of staying the progress of this affection, it cannot be through any astringent action on the kidney arresting the exit of an undue quantity of lime, which is only a sign or consequence of the disease, and not its cause. It must act by invigoration the general health, and by imparting a more healthy character to the formative processes, by virtue of which lime and other mineral ingredients in the blood are more forcibly attracted to, and fixed in, the osseous structure. Further evidence of the power of tannic acid to improve the formation of tissues, has been afforded by the increase in the volume and firmness of the soft parts of children placed under its operation, which I have frequently observed.

4. In connexion with *heterologous formations*, tannic-acid hasbeen largely employed in my practice; and as far as I can judge, and with every wish to be impartial, I believe it has been operative, [illegible] a great and valuable extent, in arresting or retarding their growth. Almost every case of incipient taubercular deposit in the lungs, which came under my care, either at the Northern Dispensary or in private practice, some years ago, was treated, at least in part, with tannic acid; and I have been agreeably surprised to find that not a few of these very patients are now alive, some apparently not nearer the grave than at that time, and some in really imimproved health. I was consulted in the case of a young lady, five years ago. The apex of the right lung was solidified with tubercle, and the patient had rapidly deteriorated. Sir James Clarke saw her with me, and Dr. Watson, at a later period, also visited her. Tannic acid was employed, after the more ordinary practice had been adopted; and though other means have been in use on different occasions, I attribute much of her present health to the acid. That lady's lung is still solidified, the respiration is bronchial, and percussion is absolutely dull; but the general health is

equal to that of the other members of the family, and permits of her going abroad.

[Dr. Alison relates several other phthisical cases in which the tannic acid seemed to be of great service. He then proceeded to say:]

5. As a *Nervine* of a lasting character, I have found tannic acid useful in several cases of nervous debility, langour, and excitability. These distressing conditions have been relieved; and the benefit, in one or two examples, has been permanent. Under the use of moderate doses of this medicine, I have known even the symptoms of weakly organization,—or, as I have thought, of impending softening of the brain, such as flightiness of speech and manner, impatience of attention of application, hasty judgments, weakness and unstable gait,—to lose not a little of their prominence. It has always, however, been my object to guard against depending on this or any other such remedy, where there has been good reason to suspect the presence of inflammatory action, even in a subdued form. When thus used as a nervine, tannic acid should generally be combined with camphor, hops, or hyoscyamus. The shower bath has been employed, and the secretions have been attended to, at the same time. Thus exhibited, I believe that tannic acid, by improving the natural galvanic battery, if our brain and nerves may be so figuratively designated, will really, in many cases of feeble volition and muscular action, produce not a little of that benefit which has been sanguinely looked for from galvanism and electricity, and which, when obtained, has been so fleeting,—at least in my experience.

Mode of Administration of Tannic Acid. For administration tannic acid is well suited. It possesses no great bitterness, is free from colour, and does not induce nausea. A little sugar or syrup will suffice to cover all unpleasantness. It is perfectly safe, and may be continued for months without any evil effect. In moderate doses, it does not reduce the secretions below the healthy standard. It may be administered at all hours,—before, or during, or after meals.

Tannic acid may be employed alone in the treatment of disease; but it is capable of exercising its virtues harmoneously with other remedies. The use of this medicine does not preclude the employment of iron, cod-liver oil, and other such means; but, on the contrary, I believe it will make them more available to the patient. It may be given at one time of the day, and the other remedies at another; or a week or a fortnight may be given alternately to each medicine. Tannic acid, moreover, may be advantageously combined at the same moment with other means. It may be prepared with bitters and aromatics, or conjoined with astringent wines.

For diseases of the mouth, tannic acid may be dissolved in water: three or four grains to the ounce of water make a strong styptic lotion. It may be reduced to a fine powder, and dusted over the parts. Mr. Morson has prepared a lozenge, which is well adapted for the mouth and throat. Each lozenge contains about half a grain of tannic acid. Some have added to them essence of cayenne, the more to fit them for relaxation of the fauces and glottis. For the stomach, the aqueous solution is well adapted; and, when a pure bitter is required, some infusion, such as that of gentian, may be used instead of water. When it is intended to influence the bowels, tannic acid is suitably exhibited in the form of pill; and as circumstances indicate, in combination with opium or other remedies. If we desire it to enter the circulation, or to act quickly, at a distance from the stomach, on some internal part, the form of solution or powder should be employed. As a styptic for the rectum, uterus, vagina, or urethra, the aqueous solution, used as an injection, will generally prove most serviceable. For local skin diseases, requiring an astringent, tannic acid may be advantageously used, either as a lotion, or in the form of ointment. As however, the application is really effective, it will be well to attend, at the same, to any requirements that the general system may demand. Reduced to a very fine powder, I have found that tannic acid may be inhaled into the lungs and air-tubes. It has produced no irritation or cough, when tolerably well managed. I have not had much experience of it in this form; but I believe that a cautious trial might be made of it in cases of disease of the lungs and air-tubes, in which the local application of a non-irritant styptic is indicated.

The dose of pure tannic acid must vary according to the circumstances under which it is employed. For urgent disease, such as hemorrhage from the stomach, bowels, or lungs, five or ten grains should be used every few hours. For chronic fluxes, wherever situated, two or three grains, given twice a day, will generally suffice. When the general improvement of the health is simply desiderated, one or two grains, two or three times daily, are enough, but the remedy should be long continued. For children afflicted with rickets, half a grain to one grain answers well, given night and morning.

Tannic acid is contra-indicated in hemorrhages and fluxes, wherever situated, which are only the relieving of an obstructed circulation, or of inflammatory or congestive action. It is, under such circumstances, calculated to do mischief. In obstinate constipation of the bowels, when circumstances render a lax state necessary, tannic acid is contra-indicated in large doses, as a general rule. Irritability of stomach and gastritis are liabe to be aggravated by tannic acid.

Several preparations of tannic acid have been carefully prepared, at my suggestion, by Mr. Morson, the eminent pharmaceutist, of Southampton-row. These preparations are the tannates of quinine, cinchonine, alumina, bismuth, and lead. They are all coloured, possess more or less the styptic taste of tannic acid, and are inodorous. I have not yet had time to make sufficient trial of them, so as to be enabled to report upon their virtues. I shall now only hazard an opinion that they, as well as tannic acid itself, will be found, upon full trial, to possess very considerable power, and to form valuable aquisitions to the resources of the physician, wherewith he may render himself more formidable to disease, and still more serviceable to the sick.—*London Journal, Jan.* 1850, *p.* 1.

161.—OBSERVATIONS ON GANGRENE. By G. J. Guthrie, Esq., F. R. S.

[After mentioning the terms ordinarily used to express varieties of gangrene, as *dry*, *humid*, and *traumatic*, Mr. Guthrie says:]

These words or terms do not convey to the mind of the surgeon any real practical distinctions, yet practical distinctions are the points required; and and to effect this objet I have made one which is on many points of the greatest importance, because it leads to an essential difference of practice—viz., into *constitutional* and *local*. Surgeons have, I am aware, spoken and written of chronic and idiopathic mortification, or certain states depending on internal causes, which have occupied a considerable time before they gave rise to any great development of evil; whereas the difference between local and constitutional mortification may depend on a few hours—a time so short, and yet so precious, that it becomes a matter of life and death in many instances. The *carpe diem* of Horace is in no case more applicable.

Constitutional gangrene may be humid or dry, whether it arises, as it were, idiopathically, following a spontaneous inflammation, or in old age, in which it appears almost as a first symptom. Local mortification may be either humid or dry, although, when it is humid, it arises chiefly from the warmth of the applications by which it is surrounded, causing it to be also the commencement of the process of putrefaction, whilst, if left to itself, or nearly exposed to the air, it would become shrivelled and dry.

Examples of humid, or the common kind of mortification, following erysipelas, are seen sufficiently often in all hospitals to render a description of it here unnecessary, and I shall confine my observations to local mortification only. The purest example of local mortification is when it occurs from the supply of blood being cut off from the foot by the division of the great vessels in the thigh.

The preparation I now present to you is unique. It shows the right femoral artery and vein of P. Turnbull, of the Grenadiers of the 74th regiment, between which a ball passed, in the spot you see marked, on the 10th of April, 1814, at the battle of Toulouse; the coats of the artery and vein being little injured, those of the artery not destroyed in substance, although bruised; they are filled above and below with coagula. This preparation is perhaps the only one in existence proving the great elasticity of these vessels, and their capability of bearing, to a certain extent, an injury without being torn, although it may have been sufficient to cause inflammation, as it did in this case, with obliteration of their canals. The case was mistaken, in the first instance, and shown to me, on the 18th of April, as an extraordinary instance of gangrene occuring without sufficient cause.

[After detailing the particulars of this case, Mr. Guthrie relates one with which he met in London some years afterwards, in which his recommendation of amputation was not attended to by the surgeons who had charge of the case. Mr. Guthrie says:]

The surgery of London was not, however, as far advanced in 1823 as the surgery of Toulouse in 1814. In the first place, these gentlemen did not know that the lower end of the femoral artery, when wounded, always bleeds black blood, not scarlet, like its upper end, so that you may have, and will have, two kinds of blood from the two ends of the same artery. This was a fact well known on the banks of the Guadiana, the Tormes, and the Garonne, but not on those of the Thames. So it was with the equally important fact, that arresting the flow of blood in the upper part of an artery would not prevent its bleeding if wounded, at its lower part. Two points so admirably exemplified in this case, and of which I believe there are few, if any men of education who at this moment doubt.

The third point, or that of the first appearance of mortification, is not so fully acknowledged, and that because it is not understood. The accident is not seen as often in all England in seven years as it was in a day in the plains of Estremadura and Castille. The existence of mortification is not acknowledged, because the part is neither *red* nor *black*, which it is presumed all mortifications ought to be. It is, in reality, the reverse, or *quite white*. It is as bad a thing in chirurgery as that *rara avis*, a black swan, was formerly in Ornithology.

In all cases like those I have referred to,—and I have reported many in my record on wounded arteries, the foot first suffers, and the failure of the circulation is usually remarked in the great toe, or in the ends of the other toes. It may so remain for days, and then extend as far as the instep, or ancle, when it frequently stops for a short time, and then proceeds as high as the calf, after which life is soon destroyed. In many cases the extension of the mortification is more rapid at the beginning and soon proceeds as high as the calf of the leg, at which part nature seems often to make a great effort to resist its further progress. The fact I state; the cause, I presume, must depend on the circulation around the knee, but whether that be the right one or not you must receive it, for the very lady-like reason that it is so, and that you have not for the present a better reason to adopt. It is on account of the fact that I have selected this part as the one at which amputation should be performed, before many people would know why it should be done at all, who overlook the wound of the artery in the thigh, or who do not understand the baneful influence it exerts on the parts below. Amputation at or above the middle of the thigh is a very dangerous operation at all times, and a very unsuccessful one in all cases of wound of its artery, accompanied by mortification of the foot and leg. The person does not die under the operation, but the stump does not take on the action necessary for his recovery. The mortification had become constitutional instead of being local before the operation was done. The stump swells, opens out, looks white, and discharges usually but little, and never healthy matter. The system generally suffers in proportion, and the patient rarely survives beyond three or four days, if he live so long. To prevent this result, amputation is to be performed as soon as mortification is so established as to be no longer doubtful. Under the most favorable circumstances the person must lose his toes, or his foot at the ancle, and an amputation a little higher, leaving room for an artificial leg, does not make the matter worse, more particularly as the cases of recovery, with the loss of the toes or the foot at the ancle, are not forthcoming, to prove the propriety of doing nothing, or for waiting for what is called a line of separation.

The patient is not aware of anything being abnormal in his foot, the sensibility and capability of motion being nearly as natural as usual. The temperature of the part, under the ordinary circumstances of being in bed, is scarcely diminished—often not perceptibly so to the touch of the observer; and when it is less, it is not beyond a degree or two of the thermometer. It is the change of colour which marks the commencement of the mischief to the initiated. The flesh-colour has changed to the white of a bad tallow candle; and as the mischief advances on the instep to the leg, this white becomes spotted like the best mottled soap. It does not turn a red or purple black, like that of a humid mortification, unless the part putrefies under the application of hot poultices, &c., but gradually shrinks and dies. The long tendon of the great toe seems to stand out along its back, and the skin becomes brown over it, and shrivelled. The person, nevertheless, can bend and extend the toe, and feel and describe his sensations when it is touched. There is no redness at first, marking the spot beyond which the commencing mortification does not extend; there is merely the difference between the natural and the altered colour of the parts. This is followed by some little swelling and slight redness, the precursers, in general, of the further progress the mortification is about to make. As time passes away, the course of all the tendons in the foot is marked by the discolouration of the skin over them, and the whole skin gradually becomes browner, dark coloured and dry, unless artificial heat changes the chemical action going on in the part, dead as to circulation, but yet alive as to motion and sensibility, although both are at this period impaired.

This mortification is local, in the first instance; how long it may remain so depends, in a great degree, on the excitability of the constitution of the patient, and is of longer or of shorter duration. There is always, however, I shall say, as a general rule, sufficient time for its continuance as a local disease, to allow of the commencing mortification being clearly perceived, and its probable extent ascertained, at an early period.

What, under these circumstances, is the precept to be followed? Is it the old Hunterian one, of waiting for the cessation of the mortification under the means employed, and the formation of a line of demarcation between the dead and the living parts, when an amputation may be performed, but which time rarely arrives before the patient dies? or is it the precept I have laid down for you, of amputating immediately, and below the knee? My decision is for the latter, and I hope it will alwas be yours.

I must impress upon you, however, that although mortification too frequently follows an injury of the main artery, when suddenly committed, and without any previous disease in the limb, it does not always do so; and that attention to the direction I have elsewhere given, of keeping up a gentle but continual friction, by the hands of assistants on the lower part of the extremity in danger, may tend to prevent it. It is a proceeding which should never be omitted in any case where a doubt exists as to the probable occurrence of the mischief which may be expected.—*Lancet, April 6*, 1850, *p.* 401.

162.—ON THE PRODUCTION OF FAT.—By Dr. Thomas K. Chambers.

To determine what portion of the digestive apparatus, and which of its secretions are most concerned in the appropriation of the fatty elements of the food, has lately been made a frequent subject of experiment. That the stomach has nothing to do with it we should have conjectured, from our knowledge of the functions and usual state of that organ. The acid mucus secreted by its walls has no effect of oily substances. The large quantity of fluid which it generally contains keeps the globules of fat floating free in the cavity, without touching its mucous membrane. The nitrogenous principles, and all substances capable of being acted upon by the gastric juice, and being made soluble in water, fibrin, starch, sugar, &c., are probably taken up, to a certain amount, by the veins of the stomach. The alimentary mass thus passes out of the pylorus in a more concentrated form, and containing a larger proportionate quantity of fat than the food eaten. Thus, M. Boussingault found that rice taken from a duck's gizzard contained much more oil than the same rice before it was eaten; and in the small intestines, the chyme held nearly five per cent. of the substance, while rice presents only a few parts in a thousand.

But in the duodenum, the chyme is mixed with two fluids, the bile and the pancreatic juice, both of which have with much reason been supposed to act chemically on fat. Stale bile is well known to dissolve oil by its alkaline reaction, and the use of it in removing grease spots from woollen textures is familiar to all dyers and scourers. But it is questionable whether in the body, and free from the gall-bladder mucus, it is alkaline, as it is seen to be after death. Our knowledge must be derived from living, not dead bile. Sir Benjamin Brodie deduced, many years ago, from experiments made on the bodies of cats, that the bile does dissolve fat; but in these animals the ducts of the liver and pancreas anastomose, so that he had no opportunity of separating the actions of the two secretions. He proves that the two jointly render fat capable of being taken up by the lacteals, but does not test their distinct powers. Indeed, in most animals that is impossile.

However, in the rabbit, a strange freak of nature presents the desired opportunity. In it, the ductus choledochus empties itself close to the pylorus, and the pancreatic secretion enters the intestinal canal eleven or twelve inches lower down, the duodenum being singularly long for an animal so small. By feeding a rabbit on a meal of fatty subtances, after a previous fast, and killing the animal about three hours afterwards, while the mass may be supposed to be passing gradually through the upper parts of the bowels, we are able to observe, first, the effect of the admixture of bile, and, twelve inches lower down, of the pancreatic fluid on the fat taken. Were the fat dissolved by the bile, evidence would be exhibited of the fact by its being taken up into the lacteals, and producing in them the well-known milky appearance. But in the specimen which is here submitted to you, it may be seen that such is not the case; the lacteals are filled with clear fluid, till we come to the entrance of the pancreatic duct. Immediately that is passed, you see them leaving the intestines in great quantities, as white as milk. It is, therefore, the pancreatic juice which renders the fat of the food capable of being absorbed by the lacteals.

The pancreatic juice has yet a further action on one of the elements of the food, which bears a certain relation to the subject we are considering; it is capable of converting starch, by digestion, for an hour and a half, at 86° Fahr., into dextrin and sugar. This observation, originally made by Bouchardat, has been corfirmed by Frerichs, (l. s. c.) Now, in an inaugural treaties, published in 1845, at Halle, by Dr. J. H. Meckel, entitled 'De Genesi Adipis in Animalibus,' the author has brought forward some evidence which induced him to believe that sugar may be converted by the bile into the oily acids. If his conjectures are correct, starch may be converted into sugar by the pancreatic juice, and that sugar into fat by the bile. Thus we have the transformation of amylaceous substances distintly traced, and the use they are of in supplying adipose matter to the system explained. And we shall thus understand the results of experiments, where starch was found to fatten. It is right, however, to say, that these experiments of Dr. Meckel's have not received confirmation from any one who has specially devoted himself to the study of chemistry.

As soon as fat has passed by the lymphatic circulation into the blood, it seems to be very rapidly appropriated to the purposes for wich it is designed, for in the healthy vital fluid very little is to be found. That quantity which can be discovered is much altered in character and chemical behaviour. Some portion of it is in union with phosphorus; and as that substance is more likely to be part of some destroyed tissue than to be derived from the food, it is a more probable conjecture to suppose the fat it is united with, to be the result of destructive than of nutritive absorption.

A further evidence in favour of the conjecture which I have ventured to throw out, is afforded by an experiment before cited of M. Boussingault, who found that in ducks fed with lard the quantity of fat in their blood did not exceed that which existed in the blood of the same animals when killed after having been for some days without food. But the rapidity with which it leaves the blood, and the slight trace found therein, is no evidence that it has not gone through that common thoroughfare where the passengers in and out of the body meet in their journeyings. What is more certain than that the sugar of diabetic urine all comes ready formed from the circulating stream? Yet how little is found in the source!

Once in the blood, the fat may be consumed for the purposes of the respiration; or it may be stored up in the vesicles prepared for its reception, into which it is poured after the manner of a true secretion.—*Lancet, May* 18, 1850, *p.* 582.

163.—ON THE ELECTRICITY OF THE AIR.—By Prof. FARADAY.

[At a recent lecture at the Royal Institution,]

Professor Faraday introduced and expounded the hypothesis of M. Pelletier, respecting the electrical relations of the earth and its atmosphere to the planetary space in which it moves.

The mode in which the electricity of the atmosphere was discovered by MM. Pelletier and Quetelet, was shown by Dr. Faraday experimentally.—The instrument employed by these investigators was a brass globe placed on a thin metallic stem, to which is affixed a delicate galvanometer needle, which indicates by a minute measurement in degrees, the amount of electricity obtained. This instrument was used by the experimentalists on the summits of high buildings, where it was above every surrounding object. The method formerly adopted was to employ for this purpose a long metallic rod, furnished with points which projected into the air to be examined. M. Pelletier's mode gives the quantity and the kind with certainty, while the old method furnishes uncertain and often contradictory results.

Dr. Faraday illustrated, by enlarged models, the influence of various degrees of elevation on M. Pelletier's electrometer; at the same time showing that no changes take place from variation of position when the instrument is moved horizontally, and that thus throughout each stratum the electricity of the air is the same. It is the vertical elevation or depression which produces a marked difference. The results obtained by M. Pelletier, are—

1. That the electricity of the air increases directly with the distance from the surface of the earth—a fact of great importance, as it influences the determination of the question whether the electricity of the earth be derived from planetary space, as Pelletier affirms, or whether, as Professor Faraday thinks, it be the result of various processes taking place on the surface of the earth.

2. The measures of divergence of the electrometer being the measure of force, it was found from a series of daily observations extending over a period of five years (1844-8,) that the quantity of electricity at the same place undergoes a regular increase and decrease in certain months of the year; that contrary to general belief the quantity of electricity is at its maximum in winter, and undergoes a decrease until it finds its minimum in June, and then again arises to its maximum in the succeeding January.

The subjoined table represents the numerical results; and from this it will be seen, that at the same level, the quantity of electricity in the atmosphere is twelve times as great in the cold month of January as in the hot month of June.

Average of Five Years, 1844-8.

MONTHS.	QUANTITY OF ELECTRICITY.
January (maximum) . .	605
February	378
March	200
April	141
May	84
June (minimum)	47
July	49
August	62
September	70
October	131
November	209
December	507

3. *The influence of the state of the sky.*—From the rsults under this head it is made evident that the highest degree of electricity is not found in cloudy weather, but in the clear serene sky, *i. e.* at a time when the atmosphere is free from clouds. Thus for the whole year the proportioned *quantity* may be represented: cloudy 186, clear 273. In reference to the monthly variations, as influenced by the state of the sky, it was found that in January, the maximum month of the year, the proportionate quantities are, cloudy 266, clear 1133. Only one exception, for an equal number of cloudy and clear days, was met with to this rule, viz., in July: the electricity on the cloudy days was 41, on the clear days 35.

4. As regards fog, snow, and rain, it was observed that the amount of electricity was the same during the two former states of weather, and was double that observed during rainy weather. The latter corresponding to the minimum of the annual electricity, the former to the maximum of the year.

5. *As to the kind of electricity in the air.*—It was noted that during a period of five years, only twenty-five observations gave evidence of resinous or *negative* electricity; the rest, consisting of 1800 observations, indicated vitreous or *positive* electricity. The negative observations were all recorded after storm or rain, or some other great meteorological change. The normally electrical state of the atmosphere may therefore be considered as *positive*.

6. *Wind.*—It was observed that when the wind was E.S.E., or S.E., two *maxima* were regularly formed, and two *minima* when at W.S.W., and that these corresponded with the other variations which have been mentioned.

7. The diurnal variations were recorded during the same period of five years, from six o'clock in the morning until nine at night. The degrees of divergence showed that there were two maxima and two minima daily. The maxima were at 8 A.M. and from 8 to 9 P.M., corresponding to the maxima of barometrical elevation, but in opposite periods to the magnetical maxima. One minimum was from 2 to 4 P.M., the other probably during the early morning hours.

All these great and regular phenomena of the atmospheric electricity, Dr. Faraday observed, are phenomena of *static electricity*, while the thunder storm, the St. Elmo light, &c. &c., are exceptional instances of *current* or *dynamic electricity;* not necessarily, however, requiring clouds for its concentration or evolution.

The Professor concluded by expressing his dissent from the theory of M. Quetelet, that the electricity of the earth was negative, and that of planetary space positive. According to this theory the only true electricity is the negative, *i e.* that produced by the friction of resinous substances, while the positive electricity is merely the absence or negation of electricity. It thus reverses all our common notions of electrical science. Dr. Faraday observed that while admitting to the very fullest extent the value of the observation and investigations of MM. Pelletier and Quetelet, which he had brought before his audience, he nevertheless could not receive the hypothesis they had framed thereon.

(These researches on the electricity of the air are not only interesting in a meteorological, but in a physiological and pathological point of view. While they account for storms in cloudless skies, and for the occurrence of severe storms during winter, or in very cold latitudes, as at Cape Horn, for instance (the Cape of Storms), they tend to throw light upon the exacerbations of disease at different hours of the day, as well as on the increase and decrease of epidemic and other diseases in different months of the year. Such remarkable changes in the electricity of the atmosphere cannot go on without affecting the static electricity of the human frame. According to the researches of Casper, the greater number of deaths from disease take place at the early hours in the morning, when the quantity of electricity in the air is reaching its minimum. Is this merely a coincidence, or is there some yet undiscovered connexion between the cessation of life and the electrical state of the medium in which the human body is placed? —Ed. Gaz.)—*Med. Gazette, Feb.* 8, 1850, *p.* 255.

164.—ON THE NATURE AND PROPERTIES OF OZONE.

This peculiar substance, the nature of which is yet far from being understood, has recently attracted much attention on account of its supposed connexion with epidemic diseases. M. Schoenbein, of Bale, has submitted it to some new experiments, the results of which were communicated by M. Becquerel, at a late meeting of the Academy of Sciences.

M. Schoenbein procures ozone in large quantities, by enclosing a small quantity of water in a balloon having a capacity of ten to fifteen quarts. Small bits of phosphorus, of one centimetre in diameter, are then placed, half in the water, half in the air of the balloon; the latter is closed imperfectly, and its contents raised to a temperature of 60 to 68 degrees Fahr. When the operation is completed,—a circumstance readily known by the peculiar smell of the air in the balloon, the latter is turned down over water to get rid of the phosphorus, and then agitated to wash the compound. A cork, supporting two tubes, is now attached to the balloon, and through one tube some water is introduced, while the other gives exit to the ozone. This substance, when concentrated, has an odour resembling that of chlorine; when mixed with air, it gives out an odour like that emitted from an electric machine, while in motion. Air, thoroughly charged with ozone, produces some difficulty of breathing, and, according to M. Schoenbein, is often the cause of catarrhal affections. Small animals placed in it die quickly. Ozone is insoluble in water; it destroys rapidly organic colouring matter, as well as those having albumen and ligneum for their base. According to the author, it is the substance which has the greatest affinity for oxygen of all known bodies. As it is invariably produced in the air by the action of artificial electric discharges, it must be produced in the atmosphere under the influence of the same cause, when natural. Nothing is more easy than to determine the presence of ozone in the atmosphere, and the variations of quantity it presents. For this purpose we have merely to test the air with some paper impregnated with a solution of sulphate or muriate of magnesia. The ozone decomposes the salt rapidly, and the paper assumes a brown tint. Generally speaking, this action on the paper is found to be stronger in winter than in summer. M. Schoenbein observed, that it was always stronger during falls of snow than at any other period. Up to the present moment this curious body has defied chemical analysis. M. Marignac thinks that it is a peculiar modification of oxygen. M. Schoenbein regards it as a bis-oxyde of hydrogen, or a substance probably containing a greater quantity of oxygen than oxygenated water. ('Gaz. Méd.')—*Med. Times, Feb.* 16, 1850, *p.* 119.

165.—ON THE DIFFERENTIAL DIAGNOSIS OF GOUT AND RHEUMATISM.—By Dr. A. B. Garrod.

[At a meeting of the Westminster Medical Society, Dr. Garrod made the following remarks on the differences between gout and rheumatism:]

Gout is a disease of advanced age; rheumatism, of youth. Gout is more common among men; rheumatism affects both sexes alike. Gout, at first at least, attacks the plethoric, and those who live high; rheumatism, generally the debiltated from any causes. Gout is frequently hereditary; rheumatism, if at all so, incomparably less so than gout. The exciting causes also differ. Gout is induced by high living, certain indigestible food, or by local injury in those strongly predisposed; cold is the principal exciting cause of rheumatism. The rich are more subject to gout, the poor, to rheumatism.

Gout frequently presents premonitary symptoms, affecting the digestive organs, which is not the case in rheumatism. Gout attacks the small joints; rheumatism the larger. In gout, one joint generally only is affected; in rheumatism, many. In gout of long standing the large joints may be attacked, and also more than one; sometimes, again, in rheumatism, the smaller joints are involved. In both diseases the affection of the joints is accompanied by pain, redness, and swelling greater than in rheumatism. In gout we have œdema and subsequent desquamation, which do not occur in rheumatism. The fever in gout is proportioned to the local inflammation; but it greatly exceeds it in rheumatism, and there is frequently profuse sweating, of an acid character. Metastasis rarely occurs in acute gout, and when it does, the brain, or stomach, suffers, the heart seldom or never; in rheumatism, the heart is frequently inflamed, and the secondary affection becomes the most important. Chronic rheumatism is more frequent than chronic gout; the latter is frequently accompanied by the secretion of a milky fluid, which constitutes chalk-stones or tophaceous deposits. Their composition is peculiar, consisting almost entirely of urate of soda, and sometimes of phosphate and carbonate of lime. In the fluid state the needle-like crystals of the urate of soda can be readily detected under the microscope. They are met with on the joints of the hands and feet, which they distort, and even dislocate; also in and around the sheaths of tendons, and even in the cancellated structure of the heads of the bones.

Colchicum possesses an almost magic power in relieving the pain in gout, but is not attended with such marked benefit in the acute form of rheumatism. There are, however, a class of cases in which, even with the utmost care, the diagnosis cannot always be made. These are called rheumatic gout; and it would seem either that the patient suffered from both diseases at once, or that the two merged into one. Dr. Garrod considers it a matter of great interest to ascertain the true nature of these cases, and to find out whether or not cases of true gout and those of rheumatism may not present similar and almost identical symptoms, and yet in their real nature be quite distinct. In a paper read before the Medico-Chirurgical Society, Dr. Garrod proved the existence of uric acid in the blood; in the healthy fluid traces of it only could be found, but in pure gout it was greatly increased, so that from 1000 grains of serum it could be crystallized and weighed. It could also be procured in the form of urate of soda. This is not the case in acute rheumatism, and in that disease no more uric acid is found than in the healthy fluid. This, then, forms a marked difference between the two diseases. Uric acid, in Dr. Garrod's experiments, was abundant in the blood in cases presenting symptoms of true gout, deficient in those of well-marked rheumatism. This he used lately as a test of the two diseases. A laborer being admitted into the hospital with a complaint in one hand, which had been previously treated as rheumatism, but presenting characters of gout, as Dr. Garrod supposed, he directed a small quantity of blood to be drawn, and discovered uric acid abundantly. The man afterwards said he had had a similar attack in the toes, and that he could at any time bring on an attack by drinking beer freely. The plan for detecting uric acid in the blood, detailed in the paper read before the Medico-Chirurgical Society, being very difficult, Dr. Garrod recommends the following, as being more simple:—He takes a small quantity of blood, say from half an ounce to an ounce, in a wide tube or small glass, and allows it to remain for some hours, to separate into clot and serum. The serum is then decanted, and from half a drachm to a drachm put on a watch glass, then acidulated with five minims of acetic acid, and a fibre of hemp from a piece of linen or tow introduded. In about forty-eight hours, when the serum has become solid from evaporation, if uric acid be present, the fibre will be covered with crystals of uric acid in the form of rhombs. An idea of the amount of uric acid present may be obtained from the number of crystals.

That these crystals are uric acid can be proved by adding a little water, when, by care, the fibre can be removed with a small pair of forceps, with the crystals adhering to it. Nitric acid and ammonia will at once determine their nature, by the production of the murexide or purpurate of ammonia. Dr. Garrod then mentioned, as an indication of gout, the presence of chalk deposits in the ear—a sign he has often observed. Sir C. Scudamore gives the tophaceous deposits as being only ten per cent. but Dr. Garrod has met with them in the ear much more frequently, so much so as in chronic cases to form a valuable sign of diagnosis. He has himself often diagnosed the disease from this mark alone, and found his opinion confirmed afterwards by the discovery of uric acid in the blood. In many cases of chronic gout, the condition of the urine will aid the diagnosis; and when there are tophaceous deposits, the kidneys appear to have lost the power of excreting uric acid, so that the urine is at all times free from lithic deposits. When the chalk-stones are formed very freely, he has often found that not 1·100th of a grain of uric acid was eliminated in the urine in the twenty-four hours. At the same time the urine may present an acid reaction—*Med. Gazette, March* 22, 1850, *p.* 507.

166.—CASES OF SYPHILITIC LEPRA, WITH OBSERVATIONS.—By ERASMUS WILSON, Esq., F. R. S.

[The first case detailed is the following:—In January, 1846, Mr. Wilson was consulted by a lady who was the subject of an eruption of syphilitic lepra. The lady, previously quite healthy, was married in March, 1845, miscarried in August, and in October was attacked with the eruption and sore throat. The husband had suffered repeatedly from venereal sores, the last of which occurred five months before marriage, he was mercurialized, and the sore healed; and for two months before his marriage he believed himself to be quite cured. He had never had any secondary symptoms.—Mr. Wilson thus remarks upon the case:]

Let us rest for awhile from pursuing the case further, and examine its features as far as we have gone.

A gentleman in the prime of manhood is saturated with syphilitic poison; the outward sign of the disease, the sore, gets well; he is saturated with mercury; the effects of the mercury subside, but, like the Leyden jar, in its relation to the electric fluid, he is still charged with the syphilitic poison. He marries, his secretions being contaminated with the syphilitic poison; these secretions are absorbed by the fresh organism into connection with which they are brought, and his wife becomes a new focus of disease.

It may be asked—Why, in a man whose blood is saturated with syphilitic poison, does the primary sore get well?—or, Why do not other sores appear?—or further, Why do not secondary symptoms of a necessity occur? The answer is obvious: the tissue of the original sore is no longer susceptible of stimulation by the poisoned blood which is brought to it for nutrition. For the same reason, the surrounding tissues are equally insusceptible. For the same reason, the skin and mucous membranes are also insusceptible of its stimulus. Mr. Lane, in his excellent lectures, published in 'The Lancet' in 1841-2, has stated his opinion that the syphilitic poison is cumulative. I believe it. He has also put forth an original and beautiful idea with regard to this poison; and this also I firmly believe. It is, that the poison is conveyed away more or less actively by the natural emunctories of the system. Now, in the case before us, although the man was saturated with the syphilitic poison, that poison was kept down to a certain point of pressure, so to speak, by the excreting organs; but if any cause of derangement of the excretory system had taken place, then the excess of poison would probably have burst forth in the form of sore throat and cutaneous eruption. Certain persons are insusceptible of secondary or constitutional symptoms; but such persons may be so, not because they have not absorbed the syphilitic poison into all their tissues, but because their excreting organs carry off the poison as quickly as it is produced.

It may be asked, How it happened, in the case before us, that the poison continued in the system of the man after he had taken mercury to the extent of producing its constitutional effects? Why did not the mercury neutralize the syphilitic poison, or why did it not supercede the syphilitic ferment by its own specific action? In replying to these questions, I would first remark, that it is clear that the mercury did *not* effect any such purpose, and in continuation I would add, that mercury possesses no such power. I agree with Mr. Lane, that mercury has no specific power in syphilis, and that its influence in removing the virus from the constitution is entirely due to its property of increasing the activity of the excreting organs. To attain this object, mercury is never required to be carried to the extent of salivation, and whenever it is so used, it is calculated to be injurious rather than beneficial to the system. Adopting this theory in the present case, it is evident that the mercury was not continued for a sufficiently long time, and that both time and power were lost by the induction of salivation.

Another fact, which, as it appears to me, is proved by this case, is the absorption of the poison by the wife, without the intervention of a venereal sore, and, as I believe, by the general surface of the mucous membrane. It is no new fact that mucous membranes are absorbent surfaces, and it is perfectly consistent with physiological action, that a poison presented to the surface of a membrane, like that of the vagina, and lying in contact with it for some time, should be absorbed. There appears to me to be no necessity for supposing that a particular spot of that membrane should be especially modified, and so give rise to a syphilitic sore. Where the poison is in a concentrated form, as when contained in the immediate secretion of a venereal sore, and when such secretion lies for a time in contact with a particular spot of mucous membrane, a venereal sore is to be regarded as a natural result; but where the poison is in a state of dilution, and diffused through a quantity of fluid, such as the seminal and vaginal secretions, there a sore appears to me to be unnecessary. I have pursued this argument to a certain length, because I am prepared to be met with some such reasoning as the following:—It is true that the patient may not be aware of the presence of a venereal sore, but such an one exists; if it be not present on the external organs, it may be higher up in the vagina, or on the cervix or os uteri. I am ready to admit that a venereal sore may be situated on the cervix or os uteri, indeed, I have seen such sores in that situation; but I am nevertheless of opinion, that in the present case, and in others of a similar kind, that I have had the opportunity of observing, there was no such sore in existence.

The syphilitic poison, like some other animal poisons, probably acts as a ferment in the blood, and is generated by a process similar to that of the production of yeast. Hence it requires an amount of time, differing in different constitutions, to acquire a bulk and force sufficient to react on the system; the time necessary for this purpose being increased, be it remembered, by the continued action of the emunctories before mentioned. In the case of the lady before us, the poison was probably absorbed during the early days of marriage, but it was not until three months after marriage that it first began to show its influence on her constitution by producing that state of disordered health which I have elsewhere termed syphilitic cachexia—namely, the low spirits, the feelings of languor and illness, the disordered state of the alimentary system, and the muddy and discolored skin. The next action of the syphilitic poison was peculiarly interesting, and, to my mind, illustrates one of the special phenomena of syphillis—namely, its proneness to attack new tissues, and newly-formed parts, to involve in its own action parts that have not hitherto felt its effects; it seized upon the embryo, and destroyed its vitality, and the result was miscarriage.

This disposition to the attack of newly-formed textures by syphilis, I regard in the light of an established law; and by means of this law, I should explain the violent effects produced on the constitution by syphilis after mercurialization has been effected. The action of mercury is to remove old parts with rapidity, while nutrition is engaged in replacing them by new: these new parts are seized upon by the syphilitic virus, and, possessing a lower degree of vitality than those which surround them, fall an easy prey to destruction. Hence the frequent occurrence of phagdæna after mercurialization, and hence, also, the destruction of the palate and mucous membrane of the fauces; and more, when the action of mercury has been carried too high or has been too much prolonged.

After the miscarriage, my patient went to the sea-side, and got well—in other words, the emunctories being restored to their healthy action, carried off from her system the syphilitic virus more speedily than it was formed, and she was in a fair way of getting thoroughly freed from the dangerous poison which lurked in her blood. Her husband, too, was absent, so that the supply was cut off, while the outgoing action was in full activity. This happy state of things endured only for a short period; she returned in September, she was again poisoned, and in less than a month syphilitic cachexia was re-established, and she became the subject of secondary symptoms, sore throat, cutaneous eruption, and swollen and tender lymphatic glands. From the beginning of October until the middle of January, more than three months, she had been suffering in this state of disease without amendment, and without hope, and without, indeed, a knowledge of the nature and cause of her complaint, when she first came before me.

My treatment of this lady was very simple. I enjoined her to avoid sexual excitement, and gave her several powerful doses of calomel and colocynth at intervals of three days, exhibiting on the intermediate days, and until her secretions became healthy, the nitric and sulphuric acids, with a bitter infusion. I then gave her, for a short period, and until she complained of a metallic taste in the mouth, small doses of blue pill with opium; and I concluded my treatment with nitro-muriatic acid in small doses, and infusion of gentian. The suitability of this treatment to the emergencies of the case was apparent in the fact, that in five weeks after its commencement every trace of the cutaneous disease had disappeared, and she was perfectly well.

[In February, 1847, the lady consulted Mr. Wilson again. She had been confined in the previous November, and since her confinement had noticed some leprous spots on her abdomen, and slight soreness of the throat. The baby also presented a number of spots similar to the mother. In March, 1848, the lady again appeared with another child six weeks old, which was affected with various syphilitic symptoms. The mother, after being quite cured of the previous attack (as was also her child) had perceived a few fresh spots before her second confinement, but these had disappeared in a few weeks. Mr. Wilson prescribed treatment for the mother similar to that used on the former occasions, and appropriate remedies also for the child; and, under the influence of these means, both recovered.]

Observations.—In the foregoing case it is evident that the syphilitic poison was maintained by two young married persons for three years, and at the conclusion of this period the poison was probably as active as it had been at first. It is natural to inquire how many years longer it might be expected to continue. Upon this point we have no satisfactory evidence. Another question that suggests itself is, was the poison maintained by the male or by the female separately, or was the disposition to its formation the result of the connexion constantly taking place between them? It is obvious that in the first instance the poison originated in the husband, and for some time afterwards was conveyed by him to the wife. Subsequently it is possible that the tissues of the wife may have taken on the poison-generating action, and the mutual connexion subsisting between them have kept both sources in a state of activity. But I am quite of opinion, that if they had ceased to have intercourse, the poison by degrees have been eliminated from the system of both. These considerations raise a new question —namely, as to the influence which the stimulus of pure sexual intercourse may have in keeping up the poison-generating action in persons who have at some previous period been inoculated with the poison of siphilis.

The children in this case afforded a corroberation of the views which I have now put forth. In the first instance the poison was new to the tissues of the mother, and acted violently upon them and upon the new organic being which was undergoing development in her womb. The consequence was, abortion. In the case of the second conception, the virus as it were naturalized; its stimulant properties were subdued, and it spread through the embryo and fœtus without producing any abnormal action. The mother at this time was well; less poison was probably generated in virtue of the developmental action in operation in her economy; besides, the emunctories were performing their office healthily. The child was consequently born in good health, and it was not until a new influx of poison had taken place from husband to wife, and then to the child, that the latter became affected. This influx may have been the natural result of the restoration of suspended intercourse; or it may have been the consequence of some derangement of functions in the economy of the mother that checked the action of the emunctories or increased the energy of the morbid ferment.

The third child was differently circumstanced; it was born while the mother was yet suffering under secondary symptoms; shortly after certain spots had dispersed and while an excess of poison was present in her system. The child, consequently, bore traces of the disease on its hands and feet at its birth; and soon after, the causes which affected the other child coming into action, it betrayed a more serious invasion of constitutional syphilis. In what other way can we explain a second living child suffering more severely than the first; in other words, the syphilitic virus being more potent in 1848, than it was a year earlier, in 1847.

The subsequent history of these children developes the argument still further. They are weaned from their mother; they no longer draw poison from their mother's milk; the functions of nutrition and secretion are healthily performed, and they throw off the poison entirely, and become fine children. This, unhappily, is not always the case; sometimes the poisonous ferment takes up a permanent abode in the blood; it interferes with nutrition and sanguification; induces a state of the system favorable to the development of organic diseases of various kinds; or lays the foundation for scrofulous degeneration, and all its serious consequences.

The more common form of manifestation of constitutional venereal disease in infants, is, for the skin;—excoriation and fissures around the apertures of the body, the seeming consequence of acrid humours; erythema of the feet and hands, with epidermal exfoliation; and small circular and slightly elevated spots, with depressed centres, looking like lepra, in process of peripheral extension, and without its scales.

For the mucous membranes;—there is an acrid discharge from the eyes, nose, and mouth; moist excoriations at the angles of each of these apertures; aphthæ, and congestion of the mucous membrane of the mouth and fauces; a clogged state of the air-passages; tumefaction of the membrane of the trachea and larynx; and, not unfrequently, diarrhœa. The following case will illustrate these symptoms more particularly, and show the manner in which constitutional syphils, in infants, commonly exhibits itself.

Case.—In the autumn of 1849, a lady brought to me her infant, aged fourteen weeks, to obtain my opinion with regard to an eruption on the skin, under which the little sufferer had been laboring more than two months. She stated that the spots had made their appearance in the first instance, on the heels; that they next showed themselves in the cleft of the buttocks, and extended to the legs; and that, subsequently, they came out on the head, and then on the arms.

At the time of my seeing the child, the eruption had subsided on the feet and limbs, leaving behind it an exfoliation of the epiderma. The head was covered with dandriff and scurf, while on the nates there were numerous spots of a circular figure, about the size of a sixpence, with raised margin and depressed centre, of a dull red color, and bearing a close resemblance to the spots of lepra, divested of their scales.

The child was thin and weakly, its skin muddy and rough; the conjunctivæ congested, and the eyes weeping; there was a copious discharge from the nose, a thick mucous secretion clogging the mouth and fauces, a viscous phlegm in the trachea, which impeded breathing, and a hoarse cry, which indicated swelling of the mucous membrane of the larynx; the child was, besides, very uneasy and fractious, had been suffering from a somewhat severe diarrhœa, and was still relaxed in its bowels; at the angles of the eyes, nose, and mouth, the mucous membrane and skin was excoriated, and poured out an acrid secretion; and there were similar excoriations on the lips, which had produced a tender state of the nipples of the mother.

The mother was a delicate looking woman, somewhat over thirty-five years of age. She had suffered much from anxiety and want of rest during the illness of her infant, but she had never, so far as I could ascertain, had any symptoms of venereal disease, either in the form of sores or discharge, nor had she any suspicion of the nature of the disease under which her infant was labouring.

I recommended her to put her child on a nourishing milk diet, and prescribed for it the following remedies, constitutional and local:—bichloride of mercury, half a grain; tincture of cinnamon, two drachms; syrup of white poppies, four drachms; dill-water, ten drachms. A teaspoonful to be given to the child three times a day. Nitric-oxide of mercury ointment, oxide of zinc ointment, of each one ounce. Mix. To be applied to the excoriations and eruption; to the latter, with friction, several times in the day. At the end of ten days I again saw my little patient; the child had improved greatly in appearance; she was no longer fractious and irritable; the eruption was almost entirely gone; the excoriations at the angles of the mouth, nose, and eyes, and behind the ears, had healed, and the air-passages were less obstructed. I directed the continuance of the remedies for another period of ten days, by which time the child was well.

Observations.—The chief peculiarity of this case was, the transmission of the syphilitic poison from the father to the child, through the mother, without the occurrence of symptoms of any kind, external or constitutional, to denote the presence of the disease in the latter, unless, indeed, a general appearance of delicacy of constitution and frame be a symptom of constitutional syphilis, which I am quite ready to admit may be the case.

It is painful to reflect that lactation under such circumstances becomes a powerful emunctory to the mother, and that, by means of this outlet, the poison is conveyed from herself to her infant, but such is the case. The mother of this child doubtless owed her own safety from an outbreak of constitutional disease chiefly to the action of this emunctory, and partly to her removal from London to the seaside, and her temporary separation from her husband.

The power of morbid secretions to occasion excoriations of the skin needs no illustration, as it is evinced in medical practice in a hundred ways. In the present case the diseased secretions from the mucous membrane of the infant, flowing outwards upon the skin, caused the excoriations at the angles of the eyes, nose, and mouth, as I have frequently seen them produce a similar effect around the anus, in the groins, and in the neighbourhood of the genitals. The same morbid secretion occasioned excoriation of the nipples of the mother.

Hence, then, we have passing before our eyes, the phenomena of generation of an irritant poison, by a vital-chemical action taking place in morbid fluids; and we are enabled thereby to form an idea of the mode in which the syphilitic poison may be engendered by connexion between persons of unhealthy consitution, independently of extraneous origin.—*Lancet*, *Feb.* 23, 1850, *p.* 237.

167.—ON THE NATURE AND STRUCTURE OF NÆVI MATERNI, &c.—By Holmes Coote, Esq., Demonstrator of Anatomy at St. Bartholomew's Hospital.

The definition of nævi, given by Lassus, and quoted by Mr. S. Cooper, is graphic and correct—namely, that "they are an organic malformation of the skin, the natural texture of which does not exist, but a plexus of vessels is substituted for it, not endued with the natural sensibility of the cutis itself." But the inference drawn from this definition, that "they generally continue stationary during life, and may be regarded rather as deformity than as disease," is incorrect in the extreme, and is only explicable upon the supposition that the pigment stains are referred to in the latter sentence. There is scarcely any exception to the rule that a true vascular nævus, once formed, will grow, with different degrees of rapidity and at irregular intervals, as far as we know, indefinitely. It seems to act like a contagious disorder, spreading amongst the vessels in its immediate neighbourhood; consequently the larger its circumference, the quicker, *cæteris paribus*, is its increase, and the more widely spread the tendency in vessels apparently healthy to take on the same morbid action.

Mr. Cooper observes that the nævi familiar to us as vascular cutaneous or subcutaneous swellings, occurring usually in those parts of the body where the circulation is most active—namely, the skin of the face and head, the chest, or upper extremities—"are either of the same nature as the disease well known by the name of aneurism by anastomosis, or bear a considerable resemblance to it." Now, under the name of aneurism by anastomosis, Mr. John Bell describes a species of aneurism resembling some of the bloody tumours which appear in new-born children,—a disease originating from some accidental cause, marked by a *perpetual throbbing*, growing slowly but uncontrollably, and rather irritated than checked by compression. To how many has it happened to witness in young children, patients of this hospital, pulsating nævi connected with the ramifications of arteries? I cannot recall to mind a single case, and am consequently at a loss to appreciate the statement of the late Mr. Liston, that "some of the large nævi in children pulsate synchronous with the heart's action." A pulsating tumour, however, occurs, as Mr. J. Bell remarked, in adults, and in those situations where the circulation is most active, such as the integuments of the head or face, and more particularly the lip.

As aneurisms by anastomosis are very uncommon, I will briefly state the particulars of a case which I had the opportunity of seeing and examining three years ago. A gentleman, about forty years of age, consulted Mr. Lawrence for a pulsating tumour, occupying the right half of the lower lip. He stated that it was congenital, and had increased slowly up to the present time. Some time ago the right facial artery had been tied by another surgeon, and during the operation profuse hemorrhage took place from a vessel towards the side of the tumour. No perceptible diminution in the swelling ensued,—a result which will not surprise any accustomed to view, in an injected subject, the free anastomosis of the coronary arteries of the right and left side of the face. Mr. Lawrence extirpated the whole pulsatory mass with the knife, Jan. 11th, 1847. There ensued very little more hemorrhage than would have taken place after extirpating a cancer of the lip. The ends of the coronary arteries and of one smaller vessel were tied, and the patient recovered without an unfavourable symptom. Mr. Lawrence kindly gave me the tumour to examine, and I injected it with mercury. It was composed of arteries, in the natural state of the diameter of a large pin, dilated for about an inch of their course into great sinuses or canals, the cavity of which equalled that of the radial artery in the adult. They freely communicated one with another, and were lodged in the natural structure of the lip, to which they were attached by loose areolar tissue. Upon the divided surface there were the cut orifices of eight arteries, some of them of considerable size. The walls of these dilated arteries were thin, but I failed in detecting anything remarkable by microscopical examination. Here, then, is an instance of aneurism by anastomosis. It is a pulsating swelling connected with a few arteries of some considerable size. It is obvious that there exists a wide difference between this disease and the nævus of infants, as commonly seen, which consists in a pulseless red vascular spot, seated in or under the integument, and composed of dilatations of the capillaries which constitute the skin.

Therefore *aneurism by anastomosis* consists in a dilatation of several arteries for a certain part of their course.

Nævus maternus is composed of a congeries of capillaries.

The two diseases are essentially distinct, and require different modes of treatment.

There remains a third variety of vascular tumour, of which there have been of late in the hospital some good examples. The first case of this kind which fell under my observation was in the year 1845.

A delicate young man, æt. 20, an undergraduate at Oxford, consulted Mr. Lawrence for an oblong, pulseless, blue-coloured vascular tumour, of four years' duration, situated in front of the abdomen, over the inferior ribs of the right side. It was firm, having been frequently cauterised. The blood when squeezed out by pressure, did not readily flow in again.

The patient attributed the disease to the rubbing of the braces; indeed, his attention was first directed to the part by the irritation which he experienced in walking. The whole mass, including some diseased integument, was extirpated by the knife: one small cutaneous artery only was tied, but the bleeding was inconsiderable. The tumour upon examination was found to consist of a number of tortuous and dilated vessels, which I concluded, from the thinness of their walls, the collapsed state of the cut extremities, which were healthy, the want of pulsation during life, and the general varicose appearance of the part, to be *veins*. They contained a thin watery yellowish-red fluid, which, under the microscope, was seen to contain blood-discs in small quantity, altered in shape, and jagged at their edges; granules, probably the remains of decomposed blood-discs; epithelium, and fatty matter.

The wound healed without a bad symptom, and the gentleman left town in a fortnight.

Now in a vascular tumour removed recently in the hospital by Mr. Lawrence, which closely resembled, in its general characters, the vascular swelling just described, I was interested in observing several of those hard concretions known by the name of phlebolithes. Phlebolithes, or vein-stones, are confined to the venous system, and their presence in such a tumour may be taken as very conclusive evidence as to the character of the vessels affected. It is the opinion of the best pathologists that vein-stones form in consequence of a limited sub-inflammatory process, which determines a coagulation of the blood in distinct layers; the coagula, for the most part spherical in shape, continued for a length of time subject to an interchange of action and reaction with the passing current of venous blood, and there is deposited in them phosphate of lime and magnesia, until the whole clot is transformed into an earthy mass. They form, then, originally, not external to, but within the vein. I believe that the same phenomenon has never been observed in the arterial system.

It has been remarked of these venous tumours, that although they have a tendency, in common with other similar degenerations affecting the vascular system, to indefinite increase, they manifest an occasional disposition to invest themselves in a capsule of the areolar membrane with which they are surrounded; their farther growth then becomes limited, and they may remain stationary for many years; but we have no fair grounds for anticipating, under any circumstances, a spontaneous action determining to a permanent cure.

In connection with these venous swellings, affecting the integument and the subjacent areolar structure, I may mention a morbid degeneration of the veins of muscles, an instance of which was witnessed a few days ago in the dissecting-room attached to this school. A large portion of the vastus externus muscle, below the broad tendon of the gluteus maximus, was converted into an irregular soft bluish-black mass; the muscular fibres, pale and wasted, being separated and pushed aside by tortuous and dilated veins. In the mass, which measured about four inches in length and two and a half in breadth, there was no increase, either in number or size, of the arterial ramifications; but the small veins, not capillaries, were enlarged to five or six times their natural diameter; the coats were thin; the tissues in which they ran loose and healthy. Let it not be thought that in bringing forward a case of varicose veins in muscle I am wandering from the subject; the affinity between the dilitations of arteries and veins, whatever may be their size, and the condition of the capillaries constituting an ordinary nævus, is considerable. In further illustration of these points I may mention a case which I saw many years ago, the particulars of which are firmly impressed upon my memory:—A little girl, the daughter of a physician, had a soft congenital swelling, with undefined edge, the size of half a walnut, over the right deltoid muscle. As it was increasing in size, it was examined by several surgeons, who concluded, from its situation, its softness, the freedom from pain, and other symptoms, that it was a fatty tumour. Its removal being thought advisable, an incision was made through the integuments of the shoulder, in the belief that there would be brought into view a lump of soft fat, surrounded by a loose capsule; but the incision was continued down to the fibres of the muscle without displaying anything morbid, and it became obvious that the mass, whatever might be its nature, was situated deep under the deltoid muscle, in the vicinity of the shoulder-joint. Now I scarcely need remark, that, as a general rule, the deeper seated a tumour the more unfavorable is its character; and the idea immediately suggested itself, that in the present instance it might prove a medullary growth, which would involve the loss of the whole upper extremity. The deltoid muscle was divided longitudinally, when a vascular mass was discovered imbedded in its substance; the bleeding was inconsiderable, and for the most part venous; and the morbid structure was readily removed. The case terminated perfectly well, and I understand that the patient, now full-grown, has little or no scar left to commemorate the event.

If we group together the different vascular tumours to which allusion has here been made, and which include, as far as I know, all the varieties affecting the skin and subjacent soft parts, we may arrange them in the following order:—

1. Aneurisma per anastomosem, which pulsates synchronous with the heart's beat; a true aneurism of the smaller arteries, involving all their coats and their entire circumference.

2. Nævus, affecting the capillaries either of the skin (cutaneous) or of the subjacent areolar tissue (subcutaneous,) the common nævus of infants, which does not pulsate.

3. The venous swelling, which does not pulsate, and which has been observed in the subjacent areolar tissue and in muscle.

I regret that it is not in my power to describe from microscopical examination the condition of the walls of the dilated vessels. It would be highly interesting to ascertain whether there was any change in the elastic coat of the vessels, which would explain the reason of their yielding to the pressure of the current blood.

It so happens, however, that the means employed for the cure are such as to destroy the diseased parts *in situ*. It rarely happens that a surgeon willingly undertakes to remove by the knife from infants, all of whom bear the loss of blood badly, a tumour composed entirely of vessels; the mere division of the skin is followed by a flow of blood sufficiently profuse to blanch the child; and the further steps in the operation become obscure and tedious. Even in those cases in which extirpation becomes necessary at a more advanced period of life, the structures have been mostly blended, hardened, and changed from what they formerly were, by the previous application of the ligature or of caustics.

In the case of venous tumours I have observed that the tortuous and dilated vessels become ultimately adherent one to another, and that portions of the tubes, containing blood, are cut off, and isolated by such adhesions; the blood, no longer in the current of the circulation, undergoes change; the blood-discs become jagged at their border, then they resolve themselves into granules, and which, ultimately separating, float free in a serous fluid, thinner than the serum of the blood, in consequence of a secretion of water from the walls of the cysts into which these isolated portions of the veins are converted. The walls of the cysts, which retain little or no trace of their normal characters, become thinned and absorbed where adherent, so that communications are established between adjacent cysts; and when a tumour thus formed is cut open, it resembles a common cystic tumour, the cysts containing a fluid, which, though originally blood, has lost its red color by the disintegration of the blood-discs, and has become thinner from the influence of the secretion from the cyst-wall. From such a tumour it would obviously be impossible to squeeze out, during its connexion with surrounding structures, the whole, or even any great part, of the fluid contained in its cells; blood could be expelled only from those vessels which were continuous with the surrounding healthy veins. It is possible, therefore, that some doubt might be entertained as to the nature of such a swelling, both from the characters which it presented when *in situ*, and the appearances brought to view by examination after removal.

I have purposely avoided entering upon the question of treatment, as it would lead me far beyond the proper limits of the present communication. —*Med. Gazette. March* 8, 1850, *p.* 412.

168.—OBSERVATIONS ON THE PHENOMENA OF ENDOSMOSE.—By M. MATTEUCCI, Professor in the University of Pisa.

[The following observations are quoted from M. Matteucci's work On the Physical Phenomena of Living Beings,' translated by Dr. Pereira.]

Theory of Endosmose.—Dutrochet has endeavoured to give an explanation of the phenomena, of endosmose, and Poisson and Becquerel have proposed others. Thus, some ascribe endosmose to the action of an electric current developed by the contact of the two different liquids;—a current which will produce the passage of the water through the membrane, from the positive to the negative pole, as in the well known experiment of Porret. But to render this explanation probable, it would be necessary to prove that the contact of water with alcohol, solution of sugar, &c., developes electricity; which is not the case. Poisson supposed that the least dense liquid entered the capillary tubes of the membrane, and that this capillary thread, drawn down by the pure water, and up by the denser liquid, must be elevated in virtue of molecular attraction. But this explanation becomes inadmissible when we consider that alcohol, which is lighter than water, produces endosmose, and that certain calcareous and siliceous stones, placed under the same conditions as membranes and plates of clay, do not give rise to the same effect.

Up to the present time we have not any satisfactory theory of endosmose: but we know that the general conditions of the phenomenon are as follow:—

1st. That the two liquids should have an affinity for the interposed membrane. 2dly. That the two liquids should have an affinity for each other, and be miscible.

If one of these conditions be wanting, endosmose does not take place. Experiment proves that the current of endosmose is not produced by the least dense liquid, nor by the most viscid one, nor by that which is endowed with the greatest force of ascent in capillary tubes. The current is in general determined by the liquid which has the greatest affinity for the interposed substance, and by which it is imbibed with the greatest rapidity. In fact, it is evident that the membrane imbibes the two liquids unequally; and that the one which is imbibed with the greatest facility, ought to mix with, and augment the volume of, the other.

Endosmose in living beings.—What we have stated must be sufficient to convince you that this phenomenon is perhaps one of the most important physical facts applicable to the functions of living beings. Microscopic observation has now put beyond doubt that, in all tissues, whether vegetable or animal, and in those liquids which are produced by the alteration of organized and living beings, there are constantly found, at a certain epoch, microscopic corpuscles, which have a peculiar and characteristic form, and are called elementary or primitive cells. These bodies consist of an exceedingly delicate membrane, which has a spherical form, encloses a liquid, and has on its inner side a small organized body, called the *nucleus* or *cyto-blast*. The cells float at first in a liquid, which Schwann has named *cyto-blastema*, and they ultimately become included in, and almost confounded with it, when this liquid acquires a greater or less density. In different tissues, the elementary cells are more or less closely approximated to each other; the *cyto-blastema* or intercellular substance being invariably the bond of union between them. The life of the elementary cells certainly plays the most essential part in the development and preservation of the tissues of living bodies; and, since these cells are found under conditions favourable to endosmose, we have no reason for refusing to admit its existence. A vesicle filled with a liquid, and placed in the midst of another liquid, may act on the outer one, receive the surrounding liquor, and reject the one it had previously contained, by operating in a manner analogous to endosmose.

Conclusions.—The novelty and importance of the results we have obtained, must be my excuse for relating them in this extended form. The general conclusions which we have deduced from them are as follows:—

1st. The membrane interposed between the two liquids is very actively concerned, according to its nature, in the intensity and direction of the endosmotic current.

2dly. There is, in general, for each membrane a certain position in which endosmose is most intense; and the cases are very rare in which, with fresh membrane, endosmose takes place equally, whatever be the relative position of the membrane to the two liquids.

3dly. The direction which is most favourable to endosmose through skins, is usually from the internal to the external surface with the exception of the skin of the frog, in which endosmose, in the single case of water and alcohol, is promoted from the external to the internal surface.

4thly. The direction favourable to endosmose through stomachs and urinary bladders varies, with different liquids, much more than that through skins.

5thly. The phenomenon of endosmose is intimately connected with the physiological condition of the membranes.

6thly. With membranes, dried or altered by putrefaction, either we do not observe the usual difference arising from the position of their surfaces, or endosmose no longer takes place.

Endosmose of cells.—A cell is the elementary organ of all animal and vegetable tissues, and cell-life involves an act of endosmose: this shows how much the phenomenon of endosmose requires to be more completely studied, in order that we may be enabled to make of it all the applications of which it is susceptible.

Endosmotic action of purgatives.—I cannot conclude this lecture without referring to the recent experiments of Poiseuille, made with the view of explaining by endosmose the purgative action of certain substances. He found that there was endosmose through animal tissues, from the serum of the blood to Seidlitz water, and to solutions of sulphate of soda and common salt. Now this is precisely what happens when we use these medicines internally; the rejected excrements contain an abundant quantity of albumen. In this case we must admit, that endosmose takes place through the capillary vessels of the intestine, from the serum of the blood to the saline solution introduced into the alimentary canal.

These physical phenomena, which, although they do not explain all the peculiarities of the digestion of fatty substances, nevertheless contribute to render them less obscure. The chyliferous vessels, which terminate in closed or blind extremities (*en-cul-de-sac*,) and are enveloped by intestinal mucus, are, especially in a fasting animal, filled with an alkaline liquid, very analogous to lymph. After digestion, particularly when the animal has been fed on fatty substances, the liquid of the chyliferous vessels differs from what it was previously, merely by the addition of fatty corpuscles, which give it the milky appearance. It is natural to suppose, that this chemical affinity, which produces the milky liquid in the mixture of the alkaline solution and oil, is also exerted through the membrane of the chyliferous vessels, which certainly imbibes as much of the alkaline solution as of the milky liquid, formed by the action of the alkali on the fatty bodies.

The phenomena of endosmose, of which I have spoken, may also be admitted, with great probability, as one of the causes which produce absorption by the chyliferous vessels. It is certain, that absorption could not take place, if the inner sides of the intestines were not bathed with some liquid, for which the fatty bodies had some affinity.

It is easy to demonstrate, by experiments, that the alkaline condition of the intestinal coats favours this absorption. Fill two funnels with sand, equally shaken down in each. Pour into one pure water, into the other an alkaline solution; when the liquids have filtered through, pour an equal quantity of oil on each filter. For several hours, the oil will remain upon the surface of the sand, which has been moistened with pure water; whilst in the other funnel, in which the sand has been moistened with the alkaline solution, the oil will rapidly disappear by imbibition.

The neutral azotised substances which pass into the blood, after having been dissolved by the gastric juice, would rapidly destroy the neutral or slightly alkaline condition necessary to the preservation of the qualities of the blood; but the alkali of the chyle, of the lymph, of the bile, and of the pancreatic fluid, preserve the neutrality of it.

Origin of cells.—The chyle and the lymph hold in suspension a great number of small grains, which are from 1 to 2 thousandths of a line in diameter, and which appear to be formed of a fatty substance enveloped in a membrane, which is supposed to consist of a substance analogous to proteine. These same granulations exist in yolk of egg, in the milk, chyle, lymph, and in all the liquids exuded in pathological cases, or destined for new formations. These elementary granulations have been seen to unite and form a globule, a cell analogous to blood-cells; hence, they have been regarded as the morphological elements of all animal tissues.

Recently, Donné observed, by injecting milk into the blood-vessels, that the globules of milk disappeared, after some time, by becoming covered with an albuminous layer like a bladder; that they then become reduced to the condition of white globules of the blood, which, finally, also disappeared, being probably transformed into red globules. Afterwards, all the blood re-acquired the appearance which it had before the milk had been injected into it.

The organic element seems then to be reduced to a vesicle consisting of a layer of albumen collected together and organized around a *nucleus* formed principally of a fatty substance.

I can bear testimony to an important experiment made by Ascherson: it consists in putting a fatty liquid in contact with albumen. This latter instantly coagulates, as you here see. If you mix them together, and put a drop of the mixture under the microscope, you will perceive a group of vesicles, each formed of a granule of oil, enveloped by an albuminous membrane, in some degree coagulated, and, it appears, like what the real adipose cells would do, on the stage of the microscope. We can see this still better, by putting on a plate of glass, a drop of oil, and one of albumen, and slowly bringing them in contact: it is curious to observe, by the microscope, the almost instantaneous formation of a very delicate and elastic membrane, which soon acquires numerous folds. Ascherson has proved that this formation, produced by albumen and oil, is really of a cellular nature. By adding a little water to a drop of this formation, he saw the cells swell up, and at the same time some small drops of oil escaped. By using diluted acetic acid instead of water, the cellules appeared to him to become so voluminous, that they burst. In oil, on the contrary, they became compressed and diminished in size.

Evidently these facts, which nevertheless require to be varied and extended, belong to the phenomenon of endosmose, and cannot be comprehended without admitting the cellular formation. Here, then, is a physico-chemical operation, which may lead to the discovery of the formation of elementary granulations. Fatty substances, and combinations of proteine, are constantly introduced into the organism; they are met with in all animal tissues; the globules of fat, which pass into the chyliferous tubes, and are there found in an albuminous liquid, must soon become enveloped by analogous membranes; and ought, for this reason, to form vesicles resembling those which microscopic observation discovers in the chyle, the lymph, and the blood.—*Edin. Med. and Surg. Journal, Jan.* 1850, *p.* 194.

169.—USE OF ACETIC ACID IN PREVENTING THE SPREAD OF SCARLATINA.—By Dr. J. Webster, Consulting Physician to the St. George's and St. James' Dispensary.

[Dr. Webster recommends frequent sponging of patients affected with scarlatina, with tepid vinegar and water, especially in the early stages, when the skin is hot or the pulse accelerated. He states that he has great confidence in the efficacy of this means, in preventing the spread of the disease; and gives several cases in illustration of this.]—*London Journal, Dec.* 1849, *p.* 1295.

170.—ON SEMOLA, OR A NEW PREPARATION OF WHEAT GLUTEN; AND ON VARIOUS OTHER ARTICLES OF DIET.—By Lloyd Bullock, Esq.

[After speaking of the desirableness of obtaining articles of diet by which the physician may be enabled to introduce, at will, either "respiratory principles," to maintain animal heat, and satisfy the cravings of the appetite, without supplying nourishment properly so-called; or articles which are on the other hand, simply "nutritive," Mr. Bullock observes:]

In the special cases of diabetes, it has long been recognised as a desideratum to find some vegetable substances congenial to the stamach, and at the same time highly nutritious, with as little starch as possible. In many forms of indigestion and diseases of debility, it must be equally desirable to administer a diet of a similar character—namely, as nutritive as animal food, without stimulating. There is no substance in nature which seems to possess the required chemical composition and properties so perfectly as wheat gluten, and the facility with which this is separated from the starch, sugar, &c., of the wheat, has directed much attention to it. But all attempts hitherto made to convert gluten in a palatable and manageable food have failed.

I have myself prepared the gluten bread for the profession to a considerable amount, and I find it impossible to produce an eatable, not to say palatable bread, without the addition of a considerable portion of flour. The cost of this bread, too, is necessarily very great, totally precluding its general adoption, even in the comparatively rare case of diabetes, and it is so disagreeable to eat that it has scarcely been tried in other diseases.

Dr. Percy, has recently recommended the mixing of fine pollard, or ground bran, or the woody fibre of the potato, with the gluten. These substances may serve to modify, to some extent, the tough texture of the gluten, but they certainly do not make gluten bread more agreeable or more digestible.

These remarks may serve to explain my reasons for now requesting the attention of the profession to a new article of diet, under the title of Semola. A highly respectable mercantile firm having requested me to examine a substance which they propose to sell under that title, I find that it contains between fifty and sixty per cent. of wheat gluten, and to consist of this, together with pure wheat starch, in a physical condition which renders it admirably adapted to become a general article of diet. Having been made acquainted with the process adopted in its preparation, I was enabled to suggest certain modifications, by means of which an article, uniform in composition, agreeable to the taste, and well adapted for a variety of culinary purpose, may be manufactured.

It must surely be a matter of great importance, to possess a substance containing so large a proportion of the staminal principle of nutrition in a form agreeable to the stomach and pleasant to the taste, to recommend in cases of debility whether local or general.

Perhaps it would be unbecoming in me to dwell upon the special application of a substance of this charcter, as the profession will perceive at once how well adapted it is to be made the food of children, as supplying flesh and blood as freely without stimulating like animal foood; and how numerous are the occasions when it is desirable to furnish to persons of weak digestion a bland and highly nutritive diet?

Let it be observed that the practitioner is not called upon to recommend an empirical food, like those sold under the name "farinaceous," "infant food," &c., which are merely mixtures of the flour of the cheaper grains, oats, barley, &c., with raw or baked wheat flour.

The composition of Semola, as I have observed, is uniform, and its physical form renders it highly agreeable when cooked as water-gruel, milk-gruel, or made into boiled or baked puddings, added to soups, or in any other way. In all cases it is much relished. In conclusion, I cannot but think that the chemical composition and properties of Semola must render it a very valuable adjunct to remedies, and recommend it to the general adoption of the profession. Whether the small amount of starch it contains, beyond that necessarily added to the gluten bread, will preclude its use in diabetes, remains, I conceive, to be determined experimentally. There is no other case, so far as I know, where any attempt to supply food altogether without starch is desirable—and diabetes is happily rare—most assuredly that object has not hitherto been, nor is it likely to be very soon effected, but I would suggest that most of the saccharine matter of the wheat flour being washed away in the preparation of the gluten, may render the presence of simple starch less objectionable.

[In a second paper upon the subject, M. Bullock observes :]

I have assumed that the distinction between the nitrogenous and non nitorgenous principle of food was pretty generally recognised. To a certain extent this was somewhat premature : not only do may persons still refuse to recognise this distinction, but in some medical works published very recently, we find arrow-root and other substances, consisting principally of starch, recommended to be given in debility, and represented as highly nutritious. Now it should be remembered, that the different functions in the animal economy, fulfilled by these two classes of principles respectively, are established, not only on the analysis of food, and the substances derived therefrom in the body, which, by a safe process of reasoning, are assumed to be necessarily connected; but experiments have shown, that animals supplied only with starch or sugar will emaciate and die of starvation, whilst upon gluten they thrive and retain their health. Magendie's experiments upon dogs, taken in connection with the investigations of chemists, have determined the doctrine in question, if anything in science can be brought to a final detemination. I would therefore suggest the expediency of adhering in future to an uniform phraseology in speaking of diet ; for although, in certain febrile conditions of the system, amylaceous food is necessary, it must follow that in non-febrile debility, easily assimilated nitrogenous principles are those whence alone invigoration can be expected. I think, however, it will be found, that there is a considerable difference in the influence exerted on the constitution by the nitrogenous constituents of vegetables, and animal fibre, albumen, and caseine.

Wheat gluton, as it exists in the semola, is certainly less stimulating whilst it as nutritious as animal food. Several of my professional friends have given it to infants, children, and invalids, and their reports are uniform as to its being agreeable to the taste and stomach, not rejected by infants, like oat or barley gruel, &c. Indeed, in several instances where substituted for all other diet, it has proved remarkably efficient in weakly children, riviving and invigorating them in a most striking manner. When boiled in milk it leaves nothing to be desired in the way of food for infants, children, and invalids. Semola milk gruel is very agreeable as well as highly nutritious, and the combination may be especially recommended, for other reasons, as will appear from what follows.

Another matter relative to diet, which the physiologist owes to chemistry, whilst it is perhaps too little regarded in prescribing for diseases, is the necestity for the maintenance of the due association of inorganic matters with the organic constituents of food. Dr. Bence Jones has, indeed, in his lectures, well stated, in a general way, this important consideration; but there are one or two practical suggestions I would append to his excellent remarks. In sifting wheaten flour, and the separation of the cuticle, other matters are left and rejected beside the insoluble woody fibre, which unless supplied from other sources, may be needed for the purposes of the living economy. A well-known tract, by a physician, dwells much on the propriety of including the entire wheat in food, and recommends bread always to be made of wheat-meal. This excellent recommendation will be but partially adopted, the habits of society being rather in favour of refinements of food than otherwise. In fact, most of the bread sold as meal-bread, is simply made of ordinary flour, to which some pollard has been added, to give the appearance of whole meal-bread. Thus the purpose of the auther of the tract is defeated.

But there is another way to accomplish it, when it may be found desirable, in regulating the diet of a patient, to give all the constituents of wheat, merely to let him eat it simply boiled as a vegetable.

Boiled wheat, eaten with hot meat, gravy, or butter sauce, is not only one of the most ageeable, but is by far the most nutritious of all culinary vegetables. It requires to be boiled for nearly two hours, or to be steeped for ten or twelve before boiling, when about half an hour will be sufficient. It is really extraordinary that this wholesome and nourishing grain is not oftener used in the place of the potato in this way. At any rate, when the physician recognises the propriety of adding to food the entire constituents of the wheat, organic and inorganic, he may prescribe it in this way; and there is another incidental effect which may have some influence—namely, that it generally obviates constipation.

The question of the connexion of inorganic matters with the processes of digestion and assimilation, and consequently of diet, has, however, a wider range. Dr. Garrod has thrown out the suggestion that sea-scurvy may probably depend upon the absence of potassa from the food of mariners, and that it is the presence of this element in green vegetables and acesent fruits which render them such effectual preventives or remedies for that disease. Now Liebig has shown, in his late work on Food, that in the process of salting meat, not only potassa but alkaline and earthy phosphates, and other substances, are extracted, and he observes, " a change in the gastric juice, and consequently of the products of the digestive process, must be regarded as an inevitable result of a long-continued use of salted meat; and if, during digestion, the substances necessary to the transformation of that species of food be taken from other parts of the organism, those parts must loose their normal condition." Chevreul has shown that when beef is boiled in water, the inorganic substances amount to a fourth part of the weight of the matters dissolved in the soup; and Liebig has proved that these consist principally of phosphates of potassa, lime, and magnesia, and chloride of potassium.

The first practical suggestion I would make, in reference to this subject, is the propriety of adding the salts withdrawn from meat, in the process of salting, to the *biscuits* which form the staple of sea diet. If the due proportion in the quantities of the several saline substances were carefully maintained, they would certainly render sea-biscuit a far more valuable adjunct to the salted meat; in fact, they would supply exactly the inorganic constituents which the salt had withdrawn from the meat in the process necessary for its preservation. Biscuits, with this addition, would doubtless be more wholesome, and would, in long voyages, especially those undertaken into high latitudes, where fresh meat or vegetables are for a long period unattainable, most probably be an efficient means of preventing scurvy and maintaining the health of the crew.

In another part of his work, Liebig has mentioned chloride of potassium as being a very agreeable condiment, as well as a most convenient form for the introduction of potassa into the system. I would suggest to practitioners, whether it may not often happen that the medicines they prescribe, and find efficient, become so, by adding an element to the food of the patient, unwittingly excluded from his course of diet? I see no reason, indeed, why a compound condiment, composed of a due mixture of chloride of sodium, chloride of potassium, and the phosphates, should not often be recommended in the place of common table-salt, which, according to the present improved methods of manufacture, is almost pure chloride of sodium—at any rate it does not contain the admixture of other saline materials which formerly adhered to it.

Again, Liebig, in the work already alluded to, has inserted the following recipe for, and remarks on, the preparation of soup;—

"The characters of flesh at once suggest the best method of preparing, in the short space of a few minutes, the strongest and most highly flavoured soup; and any one may convince himself, by the simplest experiments, of the truth of the assertion made by Proust, that those constituents of soup, on which its taste and other properties depend, exist ready formed in the flesh, and are not in any way products of the operation of boiling.

"When one pound of lean beef, free of fat, and separated from the bones, in the finely chopped state in which it is used for beef sausages or mincemeat, is uniformly mixed with its own weight of cold water, slowly heated to boiling, and the liquid, after boiling briskly for a minute or two, is strained through a towel from the coagulated albumen and the fibrine, now become hard and horny, we obtain an equal weight of the most aromatic soup, of such strength as cannot be obtained even by boiling for hours from a piece of flesh. When mixed with salt and the other usual additions by which soup is usually seasoned, and tinged somewhat darker by means of roasted onions or burnt sugar, it forms the very best soup which can be prepared from one pound of flesh.

"The influence which the brown colour of this soup, or colour in general, exercises on the taste, in consequence of the ideas associated with colour in the mind, (idea of strength, concentration, &c.,) may be rendered quite evident by the following experiment. The soup coloured brown, by means of caramel, is declared by all persons to have a much stronger taste than the same soup, when not coloured; and yet the caramel, in point of fact, does not in any way actually heighten the taste.

"If we allow the flesh to boil for a long time with the water, or if we boil down the soup, it acquires, spontaneously, when concentrated to a certain point, a brownish colour and a delicate flavour of roast meat. If we evaporate it to dryness in the water-bath, or if possible, at a still lower temperature, we obtain a dark brown, soft mass, of which half an ounce suffices to convert one pound of water, with the addition of a little salt, into a strong well-flavoured soup.

"The tablets of so-called portable soup, prepared in England and France are not to be compared to the extract of flesh just mentioned; for these are not made from flesh, but consist of gelatine, more or less pure, only distinguished from bone gelatine by its higher price.

"From thirty-two pounds of lean beef, free from bones and fat (eight pounds dry meat and twenty-four pounds water,) there is obtained one pound of true extract of flesh, which, from its necessarily high price, can hardly become an article of commerce; but if the experience of military surgeons agree with that of Parmentier, according to whom 'the dried extract of flesh, as an article of provision in the train of a body of troops, supplies to severely-wounded soldiers a restorative or roborant, which, with a little wine, immediately revives their strength, exhausted by great loss of blood, and enables them to bear the transport to the nearest hospital,' it appears to me to be a matter of conscience to recommend to the attention of government the proposed of Parmentier and of Proust.

"Now that the composition of the extract of flesh is somewhat more accurately known, it ought to be easy to distinguish the genuine from the false. Of the true extract nearly eighty per cent. is soluble in alcohol of eighty-five per cent, whilst the ordinary tablets of portable soup rarely yield to that menstruum more than four or five per cent.

"I consider this extract of flesh as not less valuable for the provisioning of ships and fortresses, in order to preserve the health of the crew or garrison, in those cases where fresh meat and vegetables are wanting, and the people are supported by salt meat."

Now, so far as the extraction of the inorganic matters, and of organic substances not coagulable by heat are conconcerned, this process of Liebig is perfect; but it is very remarkable that all chemists who have recommended various methods of preparing soups from animal substances should have overlooked one most striking fact—namely; that by this and other similar processes they separate and reject one of the most valuable principles of nourishment—namely, the albumen. In pursuing some experiments on this subject, I have found that not only may this albumen be advantageously retained, but that when retained with the other soluble ingredients, it forms an article of diet, which, so far as its amount of nutritive matter is concerned, far surpasses any form of soup or broth whatever. However, when the inorganic constituents of meat, its flavor, and juices soluble in boiling water with some gelatine, are required, Liebig's plan of making soup is very simple and efficient. And this may be all that is desirable when given as a very light repast, or when intended to precede, in the usual way in which fashion has prescribed, a full meal of solid viands; for once fashion is right, such a light animalized fluid forms an addition to the gastric juice, and assists its office in the process of digestion.

But if it be ever desirable to possess all the soluble nourishment of fresh meat, to be able to give, in a concentrated form, the essence of meat, it is necessary to proceed in its preparation in quite a different manner. Indeed, it appears to me, that it must be often very advantageous to possess nutritive matter in a fluid form, free from insoluble fibrine, so constituted as to contain a large amount of nourishment in a small bulk. This, I conceive, can be accomplished in the following manner:—take a pound of meat, carefully separated from fat, chop it as fine as possible, (like mince-meat,)—pour upon it eight ounces of cold or luke-warm water, (the temperature *must not exceed* 100 F.,) and mix it well; let it stand an hour, stirring it three or four times; press out the fluid, which will amount to about six ounces; upon the meat pour again another eight ounces of cold or luke-warm water, and mix well as before; let it stand half an hour, occasionally stirring press again, and the fluid will this time be eight ounces; then place the apparently dry meat, broken up, in a small tin vessel, and set it in a water-bath containg cold water, heat the water of the water-bath gradually to the boiling point, and keep it boiling about twenty minutes. About six ounces of fluid will by this means exude from the meat. Mix the three fluids so obtained together; add salt, spices, or other flavouring materials, and boil for about twenty minutes in a covered vessel. The result is a thick fluid of a very peculiar appearance, from the coagulation of the albumen, which is extracted by cold water. But this albumen, from its being in small flakes or granules, must be easily digestible, and it represents a large amount of nourishment which is lost in every method of making soup, and indeed, always where soup is boiled and strained. Still further to enhance its nutritive power, and to thicken it, the addition of about one ounce of the semola above described may be recommended.

It appears to me highly desirable at all times to distinguish this preparation of meat from soups or broths; it has a peculiar physical appearance, and the profession will at once perceive its speciel applicability to cases where a large amount of nourishment is desired to be given in a small compass, in a fluid form, conditions certainly wanting in the usual way of preparing liquid animal food. On these considerations would it not be well to give it a distinct designation? I venture to propose for it the name of *trophazome*, and we might then speak of beef trophazome, chicken trophazome, &a.—*Lancet, Dec.* 15, 1849, *p.* 627; *and March* 9, 1850, *p.* 295.

171.—EFFICACY OF LUPULIN IN PREVENTING CHORDEE, &c. By Dr. Page.

More than two years since, I introduced lupulin to a limited extent into the Philadelphia hospital as a remedy to prevent nocturnal erections in different forms of acute venereal disease; and have subsequently used it sufficiently often in my practice, to justify its presentation to the profesion as a very good article for the purpose, one of great efficacy, and entirely free from many of the objections to the preparations of camphor, opium, dulcamara, stramonium, &c., which have hitherto been relied on. One of the most painful and troublesome attendants upon gonorrhœa is chordee, brought on by nocturnal erections, the occurrence of which has been completely prevented by the adminstration of lupulin at bed-time. In acute gonorrhœa it not only prevents erections, and consequently chordee, at night, but it also seems to exercise a very soothing effect on the inflamed urethra, and to facilitate the operation of medicines to cure the disease. Relief from the troublesome pain in the perineum, in chronic gonorrhœa, and during the treatment of stricture with the bougie, has been obtained by the administration of lupulin alone. In the treatment of chancres on the penis, the process of healing is often interfered with, and the efforts of nature and of the surgeon placed somewhat at defiance by the occurrence of erections which distend the parts and lacerate the edges of a weak but imperfectly formed cicatrix. In this disease lupulin has been used with the desired effect. The lupulin has been administered for nocturnal seminal emissions, and although it does not claim a curative power in this disastrous affection, it will prevent their occurrence so long as the patient is freely under its influence, and will give the practitioner an opportunity to prosecute any treatment which he may adopt, with an increased prospect of success, from the interruption to the habit of the disease, and from the prevention of erections when topical applications are made to the urethra.

Other practitioners have confirmed the opinions expressed above, and Dr. Hartshorne furnishes an example in which the venereal appetite was completely suppressed in a case of onanism by the administration of two-grain doses several times in the twenty-four hours. The ordinary dose is from five to ten grains, in the form of powder or pill, given at night, and repeated if required. It does not give rise to headache, constipation, or other unpleasant consequence. ('Philadelphia Med. Exam.') *Brit. and For. Medico-Chirurg. Review, Jan.* 1850, *p.* 276.

172.—EMPLOYMENT OF BATHS CONTAINING OIL OF TURPENTINE. BY DR. T. SMITH, Cheltenham.

[Dr. Smith recommends the employment of alkaline camphine or turpentine baths, in chronic rheumatism, lumbago, sciatica, gout, and other affections. He says:]

I have employed camphine in the form of a bath, mixed with common soda; or two pounds of the latter with from a quarter of a pint to half a pint of camphine, and half an ounce of oil of rosemary, will form an excellent bath. In delicate skinned patients, females and children ℥ii of camphine will be sufficient. I may remark, *in limine*, that the alkaline camphine bath possesses virtues peculiarly its own. In the coldest day in winter, as I have verified in more than one instance, it may be employed with the most perfect safety. Whilst the individual is in the bath, he experiences, to my knowledge, no disagreeable annoyance from the disengaged vapour; on the contrary, if we except the taste of the turpentine, which for some time remains in the mouth, a sense of calmness and tranquility very often follows a previously disturbed, irregular, or excited condition of the respiratory or sanguiferous systems. After five minutes recumbency in the bath, the pulse is found to become fuller, softer, and slower; I have seen it fall from 100 to 80. The respiration also becomes freer, deeper, and less laboured. On coming out of the bath, the whole skin has a peculiar velvety, soft, and agreeable feeling; the breath is strongly tainted with the terebinthinaceous odour. If it have not been too hot, a pleasurable tingling warmth is experienced throughout the whole cutaneous surface; and this, with the preceding symptoms,, may continue twenty-four hours. One great advantage of this bath will be found in the ciscumstance that it may be employed at a heat from 10° to 15° below the temperature of the ordinary warm one, without including that sensation of chill to which some delicate constitutions are so peculiarly obnoxious; ten or fifteen minutes is the length of time a patient ought to remain in a bath of this description. In the first instance, it is well for patients to commence with a smaller quantity of the turpentine and soda, say a pound of the latter, with two or three ounces of the former, and gradually increase its strength on each repetition of the bath, to the first mentioned proportions. This bath may be taken every second or third day, according to the urgency of the symptoms and the nature of the affection for which it is prescribed.—*London Journal, April* 1850, *p.* 329.

173.—PROBABLE DANGER FROM THE USE OF COD-LIVER OIL. By Dr. Benson.

At a recent meeting of the Surgical Society of Ireland, Dr. Benson made the following statement regarding cod-liver oil:—

It was not to be expected that a remedy of so much power could be used with impunity in all cases. Having such efficacy in checking emaciation, in restoring the wasted flesh, and bringing back colour to the faded cheek, it might be anticipated that it would in some cases of phthsis occasion a congested condition of the lung, and even give a tendency, or prove a predisposing cause to pneumonia; and this was, in fact, what he thought he had observed in some instances, and it was to this he begged to call the attention of the meeting.

It so happened that in almost every patient who died of phthisis under his care while using cod-liver oil, he found the lung congested and consolidated, not only in the neighborhood or the tubercles, but through nearly the entire of both lungs. This morbid condition, it is true, is often met with where no oil has been used, but he was struck with the greater frequency of it in the post-mortems he had made where the oil was freely administered. ('Dublin Med. Press.')—*Med. Gazette, Feb.* 1, 1850, *p.* 216.

174.—GOLDEN FLAX LINT.

The following is the description which the manufacturers give of this peculiar lint:—

"This unrivalled article is made directly from the flax, and is guaranteed to be pure linnen, free from either cotton or woollen, requires no washing in chloride of lime, nor any other irritating fluid, and may be had in pieces of any length—as 50 to 100 yards. It is uniform in thickness, grass-bleached, strong and light, cooling and healing to wounds, and free from dirt and every irritating substance. One pound of this lint contains a considerably larger surface than a pound of the common old rag lint, and is not dearer in price."

(We have examined a specimen of this lint with much care, and we regard it as a very excellent and pure article, and one that is admirably calculated to accomplish the purposes for which it is designed. Ed. 'Lancet.') —*Lancet*, *March* 2, 1850 *p*. 267.

175.—"INGROWING" OF THE TOE-NAIL.—By H. J. M'Dougal, Esq.

[Mr. M'Dougal relates the following case: a gentleman was brought to him with an affection of the great toe which rendered him quite unable to walk, from the pain which pressure of the foot upon the ground occasioned. Mr. M'D. says,]

On examination, the toe was found slightly swollen, and with a reddish, erythematous blush extending up the foot. There was a very little fungoid granulation by the side of the nail, touching which was by no means so painful as pressure either on the under part of the toe, or on the upper and inner surface of the nail. The edge of the nail was quite invisible.

I directly proposed the usual operation of division of the nail in the centre, and eversion of the affected side. This had been proposed by two surgeons, whom the patient had previously visited, and was decidedly objected to. Being left to my own resources, therefore, I proceded to scrape away, with an angle of glass, the inner surface of the nail (holding aside the flesh with the left hand) until its structure had become so thin that, with a pair of scissors, I was easily enabled to divide it for a short distance, and with forceps to lift out the piece in the corner. This gave little or no relief, and I was induced to seek further for the cause of the pain and distress felt on touching the toe. A horny-looking surface filled the space from which the piece of nail had been removed; and, on scraping round this with the point of the scissors, I succeeded in turning out a hardened mass of collected epithelium scales, nearly as large as the seed of a sweet pea. The surface underneath was red, and secreted a sanious matter. Perfect relief ensued on the removal of this extraneous matter, and the patient congratulated himself on his own obstinacy in not consenting to the very painful operation of losing half his nail. A morsel of dry lint completed his cure in twenty-four hours, and a little occasional attention to the part has since saved him from further suffering.

I am not aware that the condition I have described above has been noticed by any surgical writer in our language, with the exception of Mr. Colles, of Dublin, who refers to it as only occurring on one side of the nail. I can quite conceive, however, that with a little attention many persons might be saved the exqisitely painful and barbarous operation now so often used, of tearing assunder the inflamed matrix, confessedly one of the most tender parts in the whole structure of man.—*Med. Times*, *March* 16, 1850, *p*. 195.

176.—NEW ADHESIVE DRESSING.—By Dr. Mellez.

From his dissatisfaction with the ordinary adhesive dressings, Dr. Mellez was led to adopt a solution of "gum lac," which is much used in the arts as a varnish and adhesive.

He used a solution of this substance in spirit of wine, made with the aid of a moderate heat, and in such proportion as to give a mixture having the consistence of jelly, or nearly approaching to it. It can be made in a common wide-mouthed bottle, and a simple cork suffices for its preservation. When he uses it, he spreads it with a spatula upon pieces of cloth or taffetas, cut to the size required. According to him, it possesses all the good properties of collodion, and even in a higher degree than that substance—viz., contraction during its desiccation, impermeability to air, absence of all irritating action on the skin or wound, intimate adherence to the skin, and resistance to the action of water, fatty matters, or the discharges from the wound. It has not like collodion, the quality of being colourless; but he believes that it might, if required, be discolourized, and, if applied upon animal membrane, wound furnish a transparent dressing. It does not dry so quickly as collodion, but that is the only advantage the latter possesses. The lac dressing, however, does not require so long time as to be inconvenient to the surgeon. Moreover, it is not indispensable for the lac, as it is for the collodion, that the skin be absolutely dry. It has, further, the advantage (not to be overlooked) of being more moderate in cost. ('Bulletin de Thérapeutique.')—*Monthly Journal, June* 1850, *p.* 575.

177.—A NEW PREPARATION FOR STOPPING TEETH.—By J. T. Davenport, Esq., Bloomsbury.

[Mr. Davenport gives the following recipe :]

Pour a small quantity of collodion on a plate or glazed surface; allow it to evaporate till it acquires the consistence of a thick paste, or, in more familiar language, a pill consistence; let the cavity of the tooth be well dried, and quikly filled with the paste; in the course of a few minutes it will be hard and fit for mastication. Very slight pressure is required, and, being of a vegetable nature, somewhat analogous to the tooth itself, will resist the action of vegetable juices, and remain colourless.

[Mr. Davenport prepares his collodion in a manner different from that usually adopted. He tells us :]

My recipe differs from the usual process in three respects—viz., an increased proportion of sulphuric acid; a longer period for maceration; and an additional quantity of absolute alcohol. By the first and second alterations I obtain a more perfectly soluble cotton; by the latter the solution is considerably modified in its power of contraction, which is desirable for the aforesaid purpose.

The chemical manipulation is extremely disagreeable; the nitrous acid fumes are very abundant, consequently highly irritating to the respiratory organs. Great care is necessary in well washing the cotton; also, a moderate heat in drying it. The process is as under:

Take nitrate of potash, 4lbs.; sulphuric acid, 8lbs.; carded cotton wool, 8 oz.: mix the nitrate and acid in a glazed vessel, add the cotton, and constantly agitate with a glass rod for half an hour; then wash the cotton thoroughly in cold water, so that no trace of acid should be perceptible to test paper; then dry carefully, and the result will be a very soluble guncotton; then take a 1 oz. of the cotton; rectified sulphuric ether, 16 oz. fluid; when dissolved, add 1 oz. absolute alcohol. Allow the solution to stand twenty-four hours, and the collodion will be ready for use.—*Med. Times, March* 16 *and* 30, 1850, *pp.* 208 *and* 248.

178.—VARIOUS SURGICAL USES OF VULCANIZED INDIA-RUBBER.

Vulcanized caoutchouc has now become very common in the arts, and is likewise used in surgery. A systematic and extensive application of this substance has lately been made at Paris, for surgical purposes; and Dr. Gariel presented to the Surgical Society of that capital, on the 19th of Septem-her last, a series of apparatuses, made of vulcanized caoutchouc, for traction, compression, confinement, dilatation, suction, &c. Dr. Gariel prepares the substance by dipping the caoutchouc into a saline bath, and thereby renders the India-rubber perfectly and regularly elastic, gives to it an immense force of cohesion, prevents fatty bodies or the most energetic chemical agents (nitrate of silver, nitric, sulphuric, and muriatic acids, &c.) from acting upon it, and causes it to preserve its elasticity at extreme temperatures. It should be remembered that ordinary caoutchouc possesses none of the above named-properties. One peculiarity pervades the numerous kinds of apparatuses which Dr. Gariel laid before the Society, and that is, a very ingeniously-contrived mode of insufflating various tubes, when placed upon, or introduced into, the body, giving them a greater diameter, and increasing their power of pressure at will. We may mention a tube used for arresting epistaxis, which will plug the posterior nares by insufflating it. Pessaries and a great number of variously-shaped cushions, intended for many different surgical uses, are also made to change their size at will, by filling them with more or less air. The Society expressed its highest approval of these applications of vulcanized caoutchouc.—*Lancet, Dec.* 1, 1849, *p.* 579.

179.—CASE WHERE A NEEDLE WAS FOUND IN THE HEART.

Dr. Neill, while dissecting the body of a negro, who had suffered, though not urgently, some time before death, from palpitation, slight dyspnœa, and severe cough, and who had never complained of having received any injury, nor manifested any tendency to suicide, found a foreign body in the heart, which it was ascertained could not have fallen in during the dissection. It proved to be a broken worsted needle, two inches long; imbedded in the external wall of the left ventricle, with its point directed to the apex of the heart. It was much oxidized, and could not be moved from its situation until the cyst containing it was split up. The broken end was contained in one of the columnæ carneæ.

Cases are on record in which needles have penetrated into the heart from without. Dr. Leaming relates one of a seamstress, who thrust a needle through her chest by falling against a table, and who died, after suffering from pleurisy, pericarditis, and pneumonia, for nine months. The body of the needle was found imbedded partly in the wall of the right ventricle, and partly in the septum, while the point projected a quarter of an inch into the left ventricle. Another is contained in the 'Archives Géneralés,' 1842, in which a soldier ran two needles into his heart, and died in nineteen days. The needles had passed through the heart, and lodged in the lower part of the left lung, therein inducing an abscess. A third case is related by Dr. Graves, in which the needle, after having been run in for the purpose of suicide, was cut down upon and removed. The patient, however, died of pleurisy on the eighth day, and on opening the left ventricle where the needle had entered, a small membranous sac, about the size of a pea, and containing pus, was found.—('New York Med. Examiner.')—*Brit. and For. Medico-Chirurg. Review, Jan.*, 1850, *p.* 259.

180.—CASE OF SUSPENDED ANIMATION—RECOVERY AFTER ARTIFICIAL RESPIRATION FOR FIVE HOURS AND A HALF.—Reported by Mr. T SMALL.

[This interesting case was under the care of Mr. A. Poland, at Guy's Hospital. The following are the details:]

J. M., a stout, healthy, and lively little boy, about four years of age, seized hold about five in the afternoon, on the 5th of March, 1850, of the spout of a kettle, and swallowed some boiling or very hot water, an accdent which is but too frequent among the laboring classes. He was soon attacked with much distress of breathing, which gradually increased up to the time of his admission, at half-past ten in the evening of the same day.

Here the effects of the hot water, stated by Dr. Hall, are not, as might be supposed, *a priori*, the symptoms of inflammation of the œsophagus and stomach, but of inflammation of the glottis and larynx, resembling those of croup, &c. The child, when admitted, was suffering very much; there was great and urgent dyspnœa, hurried and abdominal respiration, a quick and very feeble pulse; the skin was cold, the countenance pale, the eyes half-shut, and the child did not take notice of any one unless roused. Nothing had been done by the parents, with the exception of hot fomentations to the throat. The little patient was immediately wrapped up in warm flannels, hot bottles were placed at the feet, and stupes applied to the throat. Shortly after these means were adopted, the child rallied, and as the pulse became fuller and more rapid, seven leeches were applied to the throat, and small doses of calomel and antimony administered. Some temporary relief then ensued, but a relapse soon took place; the breathing became much worse, (at times amounting only to a gasp,) the pulse weaker and scarcely perceptible, and the surface of the body much below the natural temperature.

At one o'clock in the morning, Mr. Poland was summoned to the child, which was then in a state of collapse, the surface cold, face partially livid, pulse very feeble and quick, breathing abdominal and laborious. Mr. Poland, perceiving the great danger of the case, immediately performed tracheotomy, in which operation he, however, experienced some difficulties, owing to the depth of the neck, the small size of the trachea, and the comparatively large calibre of the canula. A little time, therefore, elapsed before the tube was fairly introduced. When this, however, had been effected, it was securely fixed by means of tapes.

No benefit followed the operation; indeed it appeared to have extinguished the little flickering of life left in the child. No natural effort at respiration ensued—no air rushed in when the trocar was withdrawn from the canula; the pulse had already ceased to beat for some time; the surface of the body was perfectly cold; the face of a deadly hue; the lips white; the mouth and tongue of a very low temperature; the eyes half open and glossy, without evincing the slightest sensibility, and the child lay a motionless and apparently lifeless body.

No time was lost in placing a gum-elastic catheter in the canula, and performing artificial respiration, keeping it up steadily, uniformly, and not hurriedly, but slowly, at the rate of twenty-five inspirations per minute. This was persevered in for about for or five minutes, when the pulse began to beat, and the surface to become warm, but still no other signs of life manifested themselves, not even the slightest movements of twitching of a muscle, and no effort was made at natural respiration.

This state of things lasted, unchanged, for ten, twenty, and thirty minutes, and still no restoration came on; there the child lay like a piece of machinery, requiring an artificial filling of the lungs with air, and a mechanical expiration thereof, in order that the beating of the pulse and warmth of surface might be maintained; for so soon as these means were left off, both pulse and heat of surface vanished. An hour passed on, and still the same condition; changes of assistants were required every quarter of an hour, but no evident progress was made towards restoring animation.

Several times the artificial respiration was suspended to try whether any inherent vital power had rekindled, but no sign of it appeared, for the pulse ceased, and the child became cold. Two hours elapsed, and again another half hour, but still no success. It was now half-past three in the morning; most of the gentlemen present were leaving, giving up all hopes of seeing the child restored to life; it was, however, considered imperative to continue artificial respiration whilst the pulse and heat of surface could be maintained. Mr. Small then undertook the charge of the case, and with the assistance of Mr. Wood, kept up the same means in a very praiseworthy manner for two hours more, making in all *five hours and a half* of mechanical inflation of the lungs.

At last the child gave one natural gasp, drew in a long unaided respiration, and slowly expired the air. Then succeeded a short interval of repose, and a similar movement was repeated; then again came a very long pause, when the child was assisted by a puff down the canula; this happily succeeded, respiration became slowly established, the little patient began to rally, opened his eyes, and became conscious. The lips had been moistened with port wine during the period of insensibility.

The child now fell asleep, and awoke in a hour, much revived, and again slept for three hours. The tube required cleaning out very often, as much tenacious mucus blocked it up. This cleansing was, however, readily effected, by placing into the canula a second tube, which could be easily withdrawn, cleaned, and replaced, without distressing the patient. The child was ordered two grains of mercury-with-chalk every sixth hour, to be kept warm, and the inner tube to be cleaned when requisite.

Mr. Hilton saw the case in the afternoon of the third day after admission, and advised calomel, wine, and antimonials, as symptoms of bronchitis and pyrexia were becoming apparent. At the end of forty-eight hours the canula was removed altogether, and respiration readily effected through the wound. Four days after the accident the child had much improved; the mucus secreted was not so viscid, nor in such great quantity; he slept well, but was very irritable, and was ordered to take half a grain of calomel at night only.

The child progressed very favourably for the next week, all medicine was omitted, and he took nourishment and port wine. The wound in the throat showed no disposition to heal, air and mucus being expelled easily through it. He continued much the same until about twenty days after admission, when it was considered advisable that some attempts should be made to close the artificial opening. This was effected, without any distress to the patient, by applying a piece of lint smeared with simple dressing, over the aperture, a handkerchief being lightly tied round the neck. Air now found its way through the glottis—not so easily, however, as could be wished—but none came through the wound, as it now rapidly healed over.

Soon afterwards the child caught a severe cold; great difficulty of breathing ensued, requiring efforts in expiration, which were chiefly made by the abdominal muscles. A peculiar crowing noise attended each expiration, and it seemed as if there was some obstruction in the larynx, about the vocal cords, and this was the more readily supposed, as no serious inflammation could be detected in either lung by Dr. Rees. This dyspnœa became at one time so urgent, so peculiarly distressing, and produced such a repetition of some of the earlier symptoms, that the question was raised whether the healed-up wound in the trachea should be re-opened, and a tube again introduced. As the patient, however, improved a little, it was suggested by Mr. Hilton and Dr. Rees that the effects of large doses of calomel should be tried, before resorting to the operation. One grain and a half of calomel was given, every three hours for two successive days, when, during the second night, he got rid of large pieces of inspissated mucus, and soon breathed easily and naturally. The calomel was decreased, and the child rapidly and steadily recovered. He was presented, cured, April 15th, 1850, forty days after the accident, and is now on his way with his family to North America.—*Lancet, June* 1, 1850, *p.* 670.

181.—TREATMENT OF SINGULTUS BY SULPHURIC ACID.—By Dr. Schneider.

During a long practice, Dr. Schneider has met with many cases of hiccough, occurring in both sexes and at different ages, and persisting with such obstinacy as to give rise to great suffering and exhaustion. His sovereign remedy in such cases is one of the preparations of dilute sulphuric acid, which act with great promptitude. He refers also to the testimony of Dr. Duncan, in favor of this substance contained in the 'Edinb. Med. Comment,' and to that of Dr. Jacobsen, of Berlin.—('Casper's Wochenschrift.') —*Brit. and For. Review, Jan.*, 1850, *p.* 284.

182.—ON THE TREATMENT OF HEMATEMESIS AND MELŒNA.—By DR. J. M. NELIGAN, Physician to Jervis Street Hospital, Dublin.

[Dr. Neligan remarks that the greater danger of hematemesis and the greater difficulty of controlling it, as compared with melœna, seem to depend on the size of the stomach permitting a large accumulation of blood in its cavity before it contracts; its contraction "being the natural mechanical method by which the bleeding is checked." Thus, he observes,]

In the administration of remedies to stop the hemorrhage, the chief indication to be fulfilled is therefore manifestly to produce contraction of the stomach, whether the bleeding be symptomatic of organic disease or not. With this view we should be guided in the choice of styptics or astringents, and they should be administered in a concentrated form, or rather as little diluted as possible, so as not to distend the stomach. In hematemesis or melœna I place most reliance on the oil of turpentine as a styptic, and on gallic acid as an astringent; the former, by its stimulant property, excites the stomach and intestines to contract, and the latter may be given in the solid form, and is very powerful in small doses. Ice has often been prescribed to check hemorrhage from the stomach; but its tendency, when dissolved, to distend the organ, and to favor further bleeding by diluting the blood that may have previously escaped from the vessels, constitutes, I think, a very serious objection to its employment. As to blood-letting, it is only admissible in those few cases where the hemorrhage seems to be dependent on general plethora, and even in these must be regarded rather in the light of after treatment than of an immediate remedy.

The diet in all cases of hemorrhage from the stomach or intestines must be absolute. Nourishment should be given in a concentrated liquid form, perfectly cold, and in the smallest quantities at a time; and a return to the usual articles of diet should be permitted with the utmost caution.

I regard gallic acid as our most valuable astringent in hemorrhage from the mucous membrane of the digestive organs, from the uterus—in many cases of bleeding from which I have seen it prove of the greatest service, and from the urinary organs.—*Dub. Jour.. May*, 1850, *p.* 348.

183.—ON THE USE OF ERGOTINE IN EXTERNAL AND INTERNAL HEMORRHAGES.—By M. J. BONJEAN, Chambery.

Ergotine when applied to wounds has the property, M. Bonjean states, of facilitating their cicatrization and moderating inflammation of the wounded tissues. Under its influence union takes place by the first intention, and cicatrization occurs without further assistance.

In certain cases ergotine may perform all the offices of the ligature. M. Bonjean enumerates the following circumstances attendant on a capital operation in which its employment was indicated:—1. When, in order to arrest a hemorrhage, it would be necessary to disturb the lips of a wound in which cicatrization is commencing. 2. When the patient manifests a tendency to gangrene of the cut surfaces. 3. When the source of the hemorrhage is from vessels imbedded in the inflamed and swollen tissues. 4. When the blood flows from many small arteries of which the orifices cannot be perceived. 5. When hemorrhage occurs from the sloughing of an eschar, as in gun-shot wounds, &c.

In these difficulties the application of ergotine is as often efficacious as the use of pressure is ineffectual. The application of ergotine supersedes ligature of the arteries, and effects cicatrization without interfering with the permeability of the artery.

The mode of employing ergotine is to dissolve it in five or six times its weight of water, for ordinary wounds; and in three or four parts, or even in a concentrated form, for more serious hemorrhages. A portion of the tow or lint is to be moistened with the fluid, and applied with gentle pressure to the surface previously wiped. When the hemorrhage does not return on the pressure being removed, another pledget moistened with the solution is to be laid over the former, and the limb bandaged as usual. Perfect rest is to be observed.

Internal administration.—Ergot of rye has been successfully employed: 1. As an excitant of uterine contractions. 2. As a stimulant to the muscular system in general. 3. In hemorrhages and certain fluxes. 4. In congestion of the uterus. 5. As a stimulant to the nervous system.

The latter poisonous effect of ergot of rye is due, according to M. Bonjean, entirely to its fixed oil.. The preceding properties are due to the *ergotine* alone.

Simple extract, or ethereal tincture of ergot, both contain a portion of its poisonous principle. Pure ergotine is in the form of a solid extract of a deep brown color. In thin laminæ it presents a blood-red color. It has the odor of roast meet. Its taste is bitter. It is perfectly soluble in water, and this solution yields neither oil nor resin when heated with ether. ('Gazette Med.')—*Med. Gaz., May* 3, 1850, *p.* 787

184.—USE OF CHLOROFORM IN ABORTION.

[At a meeting of the Westminster Medical Society.]

Mr. I. B. **Brown** briefly mentioned a case of abortion at the sixth week, in which he was enabled to remove the ovum, which was descending irregularly, and was grasped by the os uteri, by placing the patient under chloroform. The os dilated under its influence, and he removed the ovum easily; hemorrhage, which had previously existed to a considerable extent, immediately ceased. Mr. Brown contended strongly for the employment of chloroform under such circumstances.

Dr. **Tyler Smith**, without wishing to call in question the interesting observations of Mr. Brown, had never seen a case of abortion in the early months in which he could not get away the ovum by means of a stimulating enema, such as turpentine, or a solution of cathartic pills, or a purgative mixture. He had seen some remarkable cases in which this treatment had been most successful. In one case, which he had attended with Dr. Cormack, the patient's life had been saved, when at the last extremity, by this proceeding. The use of an enema invariably produced reflex dilatation of the os uteri, and contraction of the uterus itself.

Dr. **Cormack** could safely assert, that in the case referred to by Dr. Tyler Smith, a turpentine enema had saved an abortive woman from impending death.—*Lancet, Feb.* 23, 1850, *p.* 249.

185.—INSANITY PRODUCED BY THE USE OF CHLOROFORM DURING LABOUR.

[At a meeting of the Westminster Medical Society, a few months ago,]

Dr. **Webster** related the following case, communicated to him by a professional friend, in consequence of perusing in 'The Lancet' a report of the three similar instances he had mentioned at a previous meeting of the Society. Only one drachm of chloroform, sprinkled upon a handkerchief, was used; but the effect it produced was so sudden and violent, that the patient, after inhaling, remained quite insensible, which greatly alarmed the attendants; with the insensibility there was likewise deadly paleness of the countenance; however, she slowly rallied, but had a painful and protracted labour. During several days subsequently, the lady continued in a very nervous condition, although not then actually incoherent, but she soon became so furiously maniacal as to require coercion by a strait-waistcoat. After being insane during many months, the patient gradually recovered her reason, and ultimately got convalescent.—*Med. Gazette, Jan.* 4, 1850, *p.* 33.

186.—RULE FOR ADMINISTERING CHLOROFORM.

M. **Dudart**, a dentist, who has had very extensive experience of chloroform, proposes the following rule for determining the degree to which the inhalation of this energetic agent should be carried.

On the one hand, it is necessary to produce a certain amount of insensibility, and on the other, it is dangerous to push this insensibility too far. By what sign are we to know that the inhalation has been carried to the proper extent? M. Dudart thinks we may find this sign in the species of *trismus* which affects the elevator muscles of the lower jaw. When the jaws and teeth are pretty firmly pressed against each other, and some force is required to separate them, we should suspend the inhalation, and may perform the most painful operation in full security, for the patient has ceased to feel.—*Med. Times, Feb.* 16, 1850, *p.* 117.

187.—ON THE PATHOLOGY AND TREATMENT OF DELIRIUM AND COMA.—By Dr. R. B. Todd, F.R.S.

Continued from p. 63, of this Part.

[The last form of delirium described by Dr. Todd is what he terms "*toxic delirium*," under which head he classes delirium tremens. Respecting the post-mortem appearances of the last-named disease, he says:]

If the patient die in a first or second attack, the brain and its membranes will exhibit no indication whatever of disease: but, if he has had several attacks, there will be signs of considerable alteration in the nutrition of the brain and its membranes. These changes are very similar to those which are found after frequent and repeated attacks of epilepsy. They consist of the following:—More or less of thickening and opacity of the arachnoid; enlargement of the Pacchionian glands; shrinking of the convolusions of the brain, and enlargement of the intergyral sulci.

The tendency, in general, of these cases is to recovery; but, after repeated attacks, the danger to life is greatly increased, because of the deranged state of the cerebral and general nutrition.

And it is important to remark, that, as in most of the other forms of delirium to which I have referred, a low state of the system,—the loss of blood,—powers enfeebled by a too rigid or too long continued antiphlogistic treatment,—are highly favourable to the production and the persistence of this delirium.

This form of delirium is highly interesting, because it is clearly due to the introduction of alcohol into the blood, which tends to poison the brain, and seriously to impair its nutrition. It may, therefore, be regarded as typical of a class of delirious cases, arising from the introduction of a poison into the system, and which may be designated as cases of *toxic delirium.*

The form of delirium which I have just described is very closely imitated by the habitual use of opium; the same tremulousness,—the same impairment of the powers of thought and memory,—the horrors,—are all met with, as the result of the long-continued ingestion of this drug.

When alcohol is taken into the system in large quantity at once, it produces, in many persons, a violent state of delirium, which does not cease until the greatest part of the alcohol has been eliminated.

The inhalation of chloroform, of ether, and of other substances of this kind, will produce a kind of delirium when the inhalation reaches a certain point, but which speedily passes into coma when the inhalation is carried beyond that point.

Indian hemp, henbane or hop, belladonna, conium, and, indeed, the whole class of narcotic drugs, are capable of producing, especially in some persons, delirium of this kind.

The poisons of the exanthemata, too, produce delirium: that form of delirium which often developes itself in the premonitory fever of scarlatina, measles, small pox, is of this kind, and will often disappear as soon as the characteristic skin affection becomes fully developed; or, in some severe cases, will continue throughout all the stages of the disease, until the poison has been fully eliminated from the system; or, again, in others, it will show itself only in the more advanced stages of the malady, when some check has been given.—*Med. Gazette*, *May* 10, 1850, *p.* 790.

[Dr. Todd next directs our attention to the clinical history of *Coma*, and shows that it is developed under a great variety of conditions, in close analogy with those which give rise to to delirium. Thus we have *epileptic*, *hysterical*, *traumatic*, *anæmic*, *typhoid*, *rheumatic*, and *toxic* coma; and there is also coma *from compression*, but here the analogy with delirium fails. As our space will not allow us to introduce Dr. Todd's admirable exposition of the history of all these varied forms of coma, we must refer the reader to the lectures themselves. We extract however the following remarks upon an interesting question connected with the subject of "coma from compression."]

May increased sub-arachnoid effusion cause coma?—It is a popular notion, adopted on very feeble grounds, that compression of the brain, and consequently a comatose state may be caused by the accumulation of fluid around the brain or in the ventricles. There are some very good reasons for adopting the contrary opinion, that the existence of fluid in the subarachnoid space never does compress the brain, and cannot be regarded as a cause of coma by compression.

1st. It is clearly proved by the researches of Cotunnius and of Magendie, confirmed by the best subsequent observers, that a certain quantity of fluid in the subarachnoid space, both in the cranium and in the spine, is essential to health, and that this fluid is in greater abundance in the old, where the brain has begun to shrink, than in the plump well-developed brain of the young and adult.

2dly. That in cases where the largest collections of fluid have been found around the brain, that organ has been found shrunk, not compressed; the brain has wasted, from a defective nutrition; there is no flattening of the convolutions, nor condensation of the brain substance, but a shrinking of the convolutions,—a widening of the sulci between them without any morbid change, either one way or the other, in the density of the substance of the brain. Thus it may be laid down that the quantity of subarachnoid fluid *is in the inverse ratio of the bulk of the brain*, and that with a large, well-developed brain we shall find but little subarachnoid fluid; whilst in the small, shrunk, and wasted brain, the accumulation of that fluid is considerable.

When the wasting, or shrinking, or collapse of the brain is partial—limited to the region of two or three convolutions,—a partial accumulation of fluid will take place in the situation of the shrunk part. A softening of a portion of the cerebral hemisphere will often cause a collapse of the convolutions above it, and thus space will be created for the accumulation of fluid.

2dly. I think it may be laid down that the accumulation of any large quantity of fluid in the ventricles, or the development of a tumour in the substance of either hemisphere, or the formation of a clot of blood there, is incompatible with the existence of a surrounding subarachnoid fluid. The pressure from within displaces the subarachnoid fluid, and prevents the secretion of it. Thus, we never find the two fluds, intraventricular and subarachnoid, existing together *in large quantity:* they may exist together *in small quantity* in shrunk, small, and ill-nourished brains, and more especially where the defective nutrition chiefly affects the hemispheres and the convolutions.

For these reasons I have long adopted the opinion that the effusion of a large quantity of subarachnoid fluid is a result—and a result probably of a conservative kind—of the shrinking or diminished bulk of the brain from some cause, and that in no case does the accumulation of fluid around the brain cause compression of that organ, nor can it be regarded as a cause of coma.—*Med. Gazett, May* 17, 1850, *p* 836.

[The conclusions to which the facts detailed in Dr. Todd's lectures have led him, with regard to the clinical history of delirium and coma, are thus recapitulated :]

1st. That the introduction of certain poisonous agents into the blood, either directly or through the digestive organs, is capable of producing delirium and coma. 2d. That a deteriorated and poisoned condition of the blood is favourable to the production of delirium and coma, as in the cases of rheumatic and gouty delirium and coma, and of the delirium and coma of typhus, erysipelas, and the exanthemata. 3d. That the same state or states of brain which are favourable to the production of epileptic convulsions are likewise favourable to the development of delirium and coma. 4th. That the anæmic state, or that state of blood in which the colouring matter is very deficient, is highly favourable to the production of delirium and coma. 5th. That a shock to the brain—*concussion*—may produce coma, and likewise delirium; and that compression of the brain will produce *coma*, but not delirium. And, lastly, that in all these cases the delirium or the coma may occur in their highest degrees without the slightest evidence of any inflammation of the brain or of its membranes.

But I must state, in addition to all this, that although, in the vast majority of instances, delirium and coma, even in their most highly developed states, occur independently of inflammation, nevertheless inflammation of the membranes of the brain is undoubtedly capable of producing both delirium and coma, and that it is often a matter of great difficulty to distinguish between the inflammatory and the non-inflammatory affections of this kind. The subject of inflammation of the brain is a large and most important one, which the time allotted to these lectures will not permit me to discuss now. I must content myself with observing that inflammation of the brain is, in adult subjects at least, a rare disease; and, therefore, that delirium and coma arising from this cause is of rare occurrence as compared with those other forms which I have described, and that the inflammatory delirium is generally of a low kind, resembling that of typhus, and has a great tendency to pass into coma; and further, that it is frequently ushered in by vomiting, and accompanied by a marked sluggish and slow state of the pulse.

We now proceed to inquire whether any adequate theory of the pathology of delirium and coma can be formed in the present state of our knowledge, both physiological and clinical? This inquiry involves answers to these queries:—1. What part—what organ—is affected in delirium and coma? 2. What is the nature of the affection, and is that affection the same for each and all those various forms of delirium and of coma which clinical study teaches us are apt to occur?

With regard to the first question, it is quite clear that we cannot assign any other seat for these remarkable states than the nervous system: nor can we locate them in any other part of the nervous system than in that part which is connected with the actions of the intellect, and with that reciprocal influence between mind and body which constitutes consciousness. Can we assign them their seat in the spinal cord? Certainly not; for we know that mental phenomena are completely independent of the spinal cord. The mind may act even when the connection between the cord and the brain is cut off, of which we have many proofs both in clinical observation and in physiological experiment. The removal of the hemispheres of the brain will destroy the phenomena of thought and of consciousness; but the spinal cord may be taken away piece by piece, leaving intact the centre of respiration and mental phenomena will continue unaffected save so far as concerns the partial affection of consciousness which necessarily must result from severing the connection between the encephalon and those parts of the body whose nerves are implanted in the separated portions of the spinal cord. We are conscious of the existence of our limbs through the connection of them with the spinal cord, and the connection of the spinal cord with the brain. So long as the trunks of the nerves of a limb are implanted in a state of integrity in the spinal cord, and so long as the connection between the cord and the brain is intact, so long will the consciousness of the connection of that limb with the body remain,—so long will the mind continue to have the feeling of the connection of that limb: and it is remarkable that that feeling may be fallacious; for it will exist even after the limb has been amputated, if only the conditions which I have mentioned are present—namely, the integrity of the trunks of the nerves, and of their implanted roots. Nor can it be got rid of even after a long interval of years has elapsed from the time of the amputation.

The brain or encephalon, then, is that part of the nervous system which is most directly and most intimately connected with the mind—upon which the mind exercises a direct influence, and which, in return, exercises an influence upon the mind.

Yet the brain itself is a most complicated organ in man and the higher animals; and therefore we shall have to inquire what parts of this organ are essential to a normal manifestation of the intellectual actions, and to the maintenance of consiousness.

Time would fail me were I to enter upon a full physiological discussion of these points. I must content myself with stating that there are the most conclusive reasons for regarding the convolutions of the brain as that part which is connected with intellectual change—as "the centre of intellectual actions.' It is the part of the brain which is most intimately connected with, and most readily affected by, the mind; and it is that layer of grey or vascular matter so intricately folded upon the surface of each cerebral hemisphere which is the seat of those unceasing changes which thought may produce, or which may excite thought. It is, therefore, reasonable to believe that any departure from the normal condition of this centre would create a corresponding disturbance or derangement of the intellectual action; or, if we admit that the mind may be disturbed primarily and indepently, as I think must be admitted, then it may be stated that that primary disturbance of the mind may derange and disturb the nutrient actions of this centre.

Consciousness is feeling: the simplest act of sensation indicates consciousness—such an act is the most simple condition of consciousness; any intellectual act is also an indication of consciousness. "When I smell a rose," says the late Mr. Mill, "I am conscious; when I reason, I am conscious; when I remember, I am conscious; when I believe, I am conscious; * * *" "If we are in any way sentient, that is, have any of the feelings whatsoever of a living creature, the word conscious is applicable to the feeler, and consciousness to the feeling."

It is important further to remark, that "the sensation is not the object of consciousness different from itself, but a particular sensation is *the consciousness* of the moment: as a particular hope, or fear, or grief, or resentment, or simple remembrance, may be the actual consciousness of the next moment."

In order, then, to understand the physiological conditions necessary for the maintenance of consciousness, we must analyse a simple act of sensation. When I smell a rose, what are the physiological phenomena? First, there is an impression made upon the sentient nerves; secondly, the change wrought in these nerves is propagated to the centre of sensation; and thirdly, this change produced in the centre of sensation *must be perceived* by the mind in order that a true act of sensation shall be accomplished. Thus, in the act of sensation we have two classes of phenomena—one physical, proceeding from periphery to centre; the other mental or intellectual, by which all physical change is recognised. The impression of the odoriferous particles on the olfactory nerves, and the subsequent change in the centre of sensation, is the physical part; the perception by the mind of change is the mental or intellectual part. My mind may be occupied with some engrossing subject at the time the rose is presented to the organ of smell: the physical phenomena will, nevertheless, take place; odoriferous particles will impinge upon the olfactory nerves, and the change will be produced in those nerves, and in the centre of sensetion, but the mind being occupied with some other object will not perceive the change in that centre, and therefore there will be no sensation: I shall not be conscious that such an object was presented to the organ of sense.

Thus, then, for this simplest act of consciousness, the co-operation of two parts of the brain is necessary—namely, the centre of sensation, or that part which is destined to receive sensitive impressions, and the centre of intellectual actions. The failure of the right mode of action of either of these will prevent the completion of the act of sensation. Either the physical part may fail, or the mental part.

When a man is brought under the influence of chloroform, he is incapable of sensation—partly because the centre of intellectual actions is paralysed by the influence of the chloroform, and partly because the nerves are similarly affected.

But when a man in truamatic delirium is insensible to the irritation which must be created when he moves the injured or broken leg, or in rheumatic delirium, the rheumatic joints, he is so because his centre of intellectual action is entirely engrossed with the rapid train of ideas and fancies which occupy his mind; and therefore he does not perceive the irritant change which must be produced in the nerves of the limb by the movement and displacement of the injured part.

Now the centre of intellectual actions is the hemispheric lobes of the brain or the convolutions; the centre of sensation is, as I have shown in my Lumleian lectures of last year, and also elsewhere, the optic thalami and their downward continuations, the olivary columns of the medulla oblongata, and the posterior horns of the grey matter of the spinal cord.

These, then, are the parts which are concerned in consciousness; and an affection of either or both of a certain kind must more or less affect the consciousness; an affection of the centre of sensation, by cutting off the object of consciousness—an affection of the intellectual centre, by impairing or destroying the power of perception.

An affection, however, of the centre of sensation *alone* cannot impair or destroy consciousness, because still the centre of intellectual action remains intact. Such an affection may destroy particular kinds of consciousness; but still there remains thinking, belief, memory—all which are acts of consciousness, although the evidence of their integrity rests chiefly with the individual himself. But an affection of the intellectual centre may impair or destroy consciousness even although the centre of sensation remain uninjured in any way; for it is evident that no impression, however vivid, upon the centre of sensation, can become a sensation, if the action of the intellectual centre be suspended, and the power of *perception* be thus destroyed.

Thus, then, we arrive at this conclusion, that to impair or destroy consciousness, the part of the brain which must be injured or suspended in its action must be the hemispheres—the convoluted surface—either alone or in conjunction with the centre of sensation—namely, the optic thalami and their downward continuations.

Now delirium is an affection of the intellect; coma is an affection of the consciousness.

The seat of diseased action which may cause delirium is, therefore, the centre of intellectual actions—the convolutions of the brain—or such parts as are so intimately connected with them that the nutrition of the one cannot be disturbed without the disturbance of that of the other.

The seat of the diseased action which may cause coma is the same centre; with or without the centre of sensation; or the morbid process may begin in the centre of sensation, destroying certain kinds of consciousness, and may extend to the intellectual centres, making the coma complete.

From this circumstance, then, namely, the sameness of the seat of the morbid changes which are capable of producing the two states of coma and delirum, we obtain some clue to explain the remarkable analogy which we have observed to exist between the two affections as regards the circumstances under which they are apt to occur.

Having thus fixed the seat of the morbid processes which cause delirium and likewise coma, we come next to inquire what is the nature of those morbid processes.

We may obtain, I think, very satisfactory information upon this subject by referring to the circumstances under which the various forms of delirium and coma occur.

1. We know that the inhalation of chloroform and of ether will cause both delirium and coma; that the ingestion of alcohol, of opium, of Indian hemp, and other narcotic drugs, will cause delirium and coma.

A moderate dose of any of these poisons will cause delirium; a large dose will cause coma.

It seems necessary for the production of these morbid states that the poisonous material should find its way into the blood; and we know that their direct introduction into the blood is the most effectual way of creating the two states.

In such cases, then, the cause of the delirium and coma is clearly humoral. A poison circulates in the blood which has an affinity for the vesicular nervous matter of the brain, and which, therefore, disturbs its nutrition. No part is more obnoxious to the influence of any poisonous agent which may be circulating in the blood, than the vesicular matter of the convolutions of the brain: for no part is more abundantly supplied with blood vessels. The pia-mater which lies in contact with the whole of this undulating surface, is a membrane of blood vessels from which innumerable minute vessels penetrate the vesicular matter. A piece of this grey matter of the convolutions successfully injected, appears perfectly red, from the multitude and the proximity of the blood vessels; and there is no other vesicular matter in the brain except that of the laminæ of the cerebellum which is so largely supplied with blood vessels.

It was Flourens, so far as I know, who first broached the ingenious idea of a special elective affinity between certain poisons and certain parts of the brain, whereby he explained their tendency to act primarily and specially upon one part in preference to another. Thus alcohol will act primarily upon the cerebellum, and give rise to the unsteady gait of the drunkard by impairing the co-ordinary power of that centre; carried to a higher dose it affects the intellectual centre, and causes delirium and ultimately coma. Belladonna affects primarily the centre of sensation, and particularly the special centre of the implantation of the optic nerves; whence the dilated pupils and the amaurosis which arises from the use of this drug;

and afterwards, the belladonna, having paralysed the centre of sensation, destroys the powers of the intellectual centres, and causes coma.

Now what is the immediate physiological effect of a large quantity of any of these narcotics on the brain?

On examining the brains of persons dead of poisoning by opium or belladonna, the vessels of the brain are found turgid with fluid blood.

It is this congestion, some will say, which causes first the delirium, and afterwards the coma. The effect of the opium is to cause congestion; the effect of the congestion is to compress the brain.

But this explanation will not bear the test of careful examination. The congestion is rather the effect of the injury done to the brain and to the blood by the opium, whereby the attraction of materials from the blood, suited to the nutrition of the brain, is retarded, and ultimately stopped. Now this force of attraction between the blood and the tissue is a powerful agent in the maintenance of the capillary circulation; when, therefore, it is impaired, the blood moves slowly and feebly through the capillary system, and there is need of increased force on the part of the heart to keep up the circulation at all. Hence, then, in cases of this kind, the congestion is due to the condition of the blood itself—in fact to its contamination by the poison which has been introduced into it.

Nor can we discover in the brain tissue itself any evidence of its having undergone compression, such as one might fairly look for as the result of over-distension of the blood vessels.

Furthermore, if we look at the mode of accession of delirium tremens, we shall find that there is another condition requisite for the development of the malady besides the ingestion of alcohol. This is an exhausted and depressed state of the whole system caused by the withdrawal of the stimulus, or by the use of antiphlogistic remedies, or by the loss of blood, or by the privation of food.

I shall give a good illustration of this in a case which occurred to myself. I had on several occasions attended a gentleman of high professional position for illness brought on by the use of brandy and wine in undue quantity. These illnesses always consisted in attacks of vomiting, with tenderness of the epigastrium, and more or less of sleeplessness. I found that the best means of correcting these symptoms was by small doses of calomel and opium,—starvation,—and iced water.

He had one of these attacks the end of last year, which yielded very readily to the treatment pursued, in the course of three days, and on the fourth day I allowed him a mutton chop and one glass of wine. I should have been more liberal in my allowance had I known that during the previous night he had threatenings of the horrors. In the evening of the day on which he had the chop and wine,—the first food of a substantial quality which he retained on his stomach for some days,—he began to have illusions, to fancy he saw persons in the room, and to see black-beetles crawling over him. This, however, passed off, and he slept for an hour or two. When he awoke, the illusions came on stronger than before; he got up in a rage, and went to his servant's room adjacent, collared him, and accused him of introducing strange men into his room for the purpose of robbing him. The delirium now manifested itself in full force, but yielded very readily to the free administration of alcohol and opium.

A preliminary condition, however, necessary to the development of delirium tremens is a deterioration of the blood by alcohol. No doubt exists now that in cases of poisoning by alcohol the alcohol enters the blood, and by a very rapid absorption. It seems certain that alcohol is one of those substances which is directly absorbed into the blood vessels of the stomach without undergoing any change in that organ; for MM. Bouchardat and Sandras have detected it in the veins of the portal system; and Dr. Percy has added to our knowledge the important and interesting fact, that alcohol appears to have a special affinity for nervous matter, for he found it in animals poisoned by alcohol, in the brain in large quantity, and in considerably greater proportion than in an equivalent quantity of blood,—a highly significant fact, explanatory of the injury done to the nervous system by the habitual use of stimulants of this kind in undue quantity.

When alcohol is taken into the system, then, it enters the blood directly unchanged, and it is eliminated partly as alcohol,—at the lungs, at the liver and the kidney, for Dr. Percy detected it in both those fluids. Now at each of these places it must injure the blood,—at the lungs, by attracting a portion of the oxygen which ought to go to the blood itself, thereby diminishing the oxygenation of that fluid,—at the liver and kidneys, by interfering with the eliminating power of those organs for their appropriate materials; for there can be no doubt, from the frequent occurrence of disease of the liver and kidneys in habitual drunkards, that it must materially affect the nutrition, and therefore the secreting power of those glands.

But as the alcohol is eliminated only in very small quantities at the three points I have mentioned, it is highly probable that it undergoes chemical change in the blood; that it attracts the oxygen of the blood, and becomes converted into carbonic acid and water. Thus it would rob the blood of some of its oxygen,—it would supply carbon in perhaps deleterious quantity,—and it would increase the quantity of water. This increased proportion of water in the blood would seem to be by no means favorable to the natural changes of the blood itself, by which I mean more particularly those connected with the development and growth of the blood particles,—especially the red particles.

Hence we so commonly find habitual drinkers pale and flabby, as if their blood contained too much water and too little coloring matter; and, in the absence of any satisfactory analysis of the blood of such persons, it may be stated that the fluid is probably defective in its solid ingredients, especially its coloring matter, and contaminated probably by some of the principles of the bile and urine, and by some other compound derived from a depraved secondary assimilation of the brain.

We are as yet greatly in want of sufficiently numerous and accurate analyses of the blood and urine in this as in all the varieties of delirium. Dr. Bence Jones some years ago pointed out that in cases of delirium tremens the discharge of phosphates by the urine is almost completely suspended; but these observations were made upon very few cases, and I am not aware that they have received confirmation from subsequent observers. In a few analyses of the urine of patients laboring under chronic epilepsy, and addicted to habits of intemperance, made for me by my friend Mr. L. Beale, jun., (than whom I know no more competent chemist,) I have not found a deficiency of phosphates, but rather an increase. But this is clearly a point requiring extensive and minute investigation, great precaution being used as to whether the phosphates discharged are due to any peculiarities in food, or to any excessive waste in the nervous matter, of which phosphorus forms an important ingredient.

I think I have now stated enough to enable us to enunciate a theory of the pathology of delirium tremens. I would lay it down, then, that it is a delirium essentially humoral in its origin,—due to a perversion of nutrition, and especially of the nutrition of the brain, by the slow and constant ingestion of a poison—namely, alcohol; and that the poisonous element which contaminates the blood, and which is left free to exercise its destructive and irritating influence upon the brain, when the powers of the system are exhausted, and the blood impoverished by bad living, and the employment of depressing remedies; that this poisonous material is a compound partly of alcohol itself, partly of some material derived from a depraved destructive secondary assimilation of the brain itself,—a material analogous to, if not identical with, that which probably is apt to be developed in the blood in epilepsy, and which by its periodical accumulations gives rise to the paroxysms of that disease.

This view of the pathology of delirium tremens will, if carefully compared with what we know of its clinical history, afford an adequate explanation of that disease. The peculiar affinity of alcohol for the nervous tissue explains the early signs of enfeebled nervous power manifested by habitual spirit drinkers; the assumption of the existence of a poison in the blood distinct from alcohol, but generated in consequence of the habitual ingestion of that fluid, will explain the production of the delirium in the absence of the accustomed alcoholic stimulus; and the control which experience tells us may be obtained over the delirium by giving new supplies of alcohol, and by opium, indicates that the peculiar state of the blood which is generated by a long continuance of an enfeebled and depraved nutrition is highly favourable to the production of the phenomena.

Moreover, we find in this view of the pathology of delirium tremens a satisfactory explanation of the absence in recent cases of all signs of lesion of the brain, and the presence in cases of long standing of morbid changes precisely resembling those seen in chronic epilepsy. The ingestion of alcohol, even in large quantity, does not produce acute inflammation of the brain: it exalts the nervous power—it excites the battery to its highest point,—but it does so at the expense of an extreme waste of the nervous material, and of the generation of a new matter, which is deposited on the membranes and among the blood-vessels, giving rise to those opacities and thickenings of the membranes which are found in the advanced stages of this pisease, as well as of epilepsy. I have several times examined the opacites of the arachnoid membrane, which are found in cases of this kind, and have always found them to consist of an accumulation of fatty material, analogous to what we find in the coats of arteries, and which is deposited in the tubes of the kidney, or in the cells of the liver, and which sometimes takes the place of the true sarcous or fibrinous element within the sarcolemma of the muscular fibre.—*Med. Gazette, May* 24, 1850, *p.* 877.

[Having thus arrived at an explanation of delirium tremens, Dr. Todd proceeds to enquire whether the other forms of delirium admit of a similar or analogous explanation. He says:]

That form of delirium which most closely resembles it, is the renal epileptic; and this affords very striking points of analogy with delirium tremens as to the circumstances which accompany its development.

Thus, the blood is the seat of a long course of chronic poisoning due to the defective action of the kidneys and the insidious chronic disease of those organs—due, also, perhaps, to the ingestion of deleterious materials; for the subjects of this disease are frequently addicted to intemperate habits both in eating and drinking.

There is a prevailing opinion that the blood is poisoned in cases of this description by the accumulation in it of urea which the kidneys are unable to eliminate. The foundation of this view was the celebrated experiment of Dumas and Prevost, which consisted in the extirpation of the kidneys from a dog, which afterwards died with symptoms referrible to disturbance of the cerebral functions, and urea was discovered in large quantities in the blood. A similar result followed a repetition of the experiment upon dogs, cats, and rabbits, by Mayer, and also by Vauquelin and Ségalas; and in every case urea was found in abundance in the blood. Now there can be no doubt, that, in a large number of the cases of chronic disease of the kidney, urea is prone to accumulate in the blood; and it is highly reasonable to suppose that when it reaches a certain point in quantity, or when the blood assumes a certain degree of poverty favourable to the exosmose of its poisoned serum among the elements of the tissues, then the signs of poisoning appear—in the delirium or in the coma.

Very recently, my friend, Dr. Owen Rees, whose opinions are entitled to the utmost respect, has cast a little doubt upon this view of the poisonous effects of urea, by the narration of a case in which there were no symptoms of poisoning, but the poison was present: a larger quantity of urea was detected in the blood than he had ever found before in a case of Bright's disease. But Dr. Rees throws out a suggestion that probably certain tenuity of the blood is necessary to ensure the poisoning influence of the urea. In this view I fully concur, and believe that the particular exception to which Dr. Rees referred was caused by the state of the blood; for all analogy shows that a poisoning influence will take place more rapidly with a thin blood than with one of normal density.

Dr. Christison, indeed, had already referred to cases, in which the urea was present in the blood without any poisonous effects. But these were exceptional cases; and there is no reason to deny that the tolerance of the poison might have been due to a peculiarity in the blood itself.

In the recent epidemic of cholera we had too many proofs of the connexion between imperfect excretion by the kidney and delirious and comatose affections. How many were the cases of individuals who, having weathered the dreadful storm of the early and more violent symptoms, afterwards passed through delirium and coma to death; poisoned in some cases in a manner strikingly similar to that by opium, and always connected with the defective action of the kidneys! And how rapidly, and even suddenly in many instances, were the symptoms removed by a free discharge of urine! In these cases I apprehend there can be no doubt that the poison was urea.

The view then, that urea accumulating in the blood may poison the brain as alcohol and opium do, appears to me to be a highly reasonable one.

The characters of the blood in cases of chronic renal disease have been well studied, and these are identical with those which we infer to belong to the blood of patients labouring under delirium tremens. They are, an increased proportion of water—a diminution of albumen—a diminution in a very marked manner of the red particles. This condition of blood is very favourable to serous transudations through the parietes of the vessels, and very unfavourable to the removal of effete matters from the tissues. The exosmose from the blood-vessels would doubtless be immensely in excess of the endosmose unto them.

Thus, we have in this form of delirium, a chronic gradual perversion of nutrition—the development of a poison in the blood—an impoverished state of that fluid: all, conditions which we have seen to exist in delirium tremens.

There can, I think, then, be no doubt that the pathology of delirium tremens, and of the renal epileptic delirium, is essentially the same.

Nor does it appear to be at all unreasonable to view the *simple* epileptic delirium as of the same nature,—that is, due to a contaminated and impoverished state of the blood. In the Lumleian lectures last year I brought forward several facts and arguments to show that both chorea and epilepsy are diseases of humoral origin; that the epileptic paroxysm is probably caused by the accumulation of a morbid matter in the blood, which excites the polar force of the nervous matter of the brain, and so may give rise to delirium, or convulsion, or coma. If this morbid matter be determined in certain quantity to the centre of intellectual action, we have delirium; if determined at the same time, in the same, or in greater quantity, to the centres of emotion and of sensation, we have convulsions and coma.

The hysterical delirium is much of the same nature as the epileptic,—just as the hysterical paroxysm is nearly allied to the epileptic fit, and often so much resembles it as to render the diagnosis a matter of considale difficulty. There is no one of the nervous diseases which more clearly belongs to the class of humoral diseases than hysteria. It would be easy to adduce a host of facts in proof of this statement. Nor can we ever, in the most aggravated states of hysteria, ascertain the existence of any morbid process in any part or parts of the body which can at all account for the phenomena. It is common to attribute them to a sympathy with the uterus; but there are objections which appear to me to be fatal to this doctrine. First, the organ which is supposed to be thus capable of disturbing the nervous system is but poorly supplied with nerves, and has a very slight connexion with the nervous system; secondly, in many of the cases of even the most severe hysteria, the uterine affection is *nil*, or of a very trifling nature; thirdly, we have an affection of precisely the same nature in men, without any derangement in the generatives organs, or, at least, without such derangement as may be viewed as the cause of the nervous symptoms.

The uterus, however, may be, and often is, a source of contamination of the blood. There may be a great drain from the uterus by excessive menstrual flux, which impoverishes the blood; some of the morbid secretions formed at the uterus may re-enter the circulation, and so contaminate the blood: or, again, the ovaries may be defective in their action, and so matters which ought to be separated at each catamenial period may remain in the circulation, and contaminate the blood. In this way the generative organs become a source of much disturbance to the general nutrition of the body. But, besides all this, there is frequently in hysteria a very imperfect action of the digestive organs, and the liver and kidneys are much deranged; and the moral state into which patients of this kind are apt to fall is very favourable to maintaining this enfeebled state of the digestive function, and of general nutrition.

It is not, therefore, in any degree, an unreasonable view of hysterical delirium to attribute it to a similar or analogous state of the system to that which produces epileptic delirium.

It will not be difficult to apply the same reasoning which has led me to these conclusions respecting the pathology of the epileptic and hysterical delirium, to that of the rheumatic and gouty forms of delirium.

In the latter state the recent researches of Dr. Garrod render it highly probable that in every instance lithic acid exists in the blood in such quantity as to justify our regarding it as "poisoned" by that material, or by some compound of it. What is the nature of the poisonous material in the rheumatic states we have yet to determine; but it cannot be doubted that some analogous matter to that of gout is present in the blood. In both states the aspect of the patients denotes a certain poverty of blood, which is greater in the more advanced stages of the diseases, and which is also more manifest when bleeding, and other active antiphlogistic measures of treatment, have been persued.

In the case of a robust man, on the third day of rheumatic fever, who had not been bled, and with whom no active antiphlogistic treatment had been adopted, the red particles had fallen to less than 100 in 1000 parts; and, when we consider the pallor of patients in the advanced stages of this disease, it cannot be doubted that its tendency is to impair the regenerating power of the red particles.

If now we add to this, that in rheumatic fever the symptoms of delirium generally occur simultaneously with the lighting-up of an inflammation of the heart, we shall be led to compare the sudden appearance of delirium in rheumatic fever, under these circumstances, with the sudden appearance of delirium tremens under the influence of exhaustion.

The effect of inflammation of the heart, more especially when it assumes the form of pericarditis, must be to weaken its power,—to induce a state of imperfect palsy. This, indeed, must be the case, unless we suppose the heart to be exempt from the laws which influence other muscles. We often have proof of this in the weakened, depressed, intermittent state of pulse which accompanies and betokens the first invasion of pericardial or endocardial, inflammation.

Thus we may lay it down that the delirium of rheumatic fever is due to the brain being supplied with an impure blood which tends to derange its nutrition, and that this derangement of nutrition will take place in a more decided manner if the heart be enfeebled, so that the blood is feebly propelled, and the brain is imperfectly supplied. A similar derangement of nutrition affecting the centre of emotion (the region of the corpora quadrigemina) will give rise to those choreic convulsive movements which we know sometimes accompany the first invasion of delirium, or occur independently of it.

The cerebral battery being excited by a thin watery blood, deficient in its colouring matter, and perhaps also in some other of its staminal principles, and which at the same time contains a poisonous element, it is easy to understand how it will exhibit more rapid and active chemical and physical changes; and consequently will develope the nervous force with a rapidity and force which disturbs the mind, exciting repeated and irregular acts of thought, and refusing to be controlled by it.

In gout we have likewise the deranged state of blood, especially in the more aggravated cases—as in the asthenic gout: there is the same poorness of blood, with deficient colouring matter, and the blood is poisoned by lithic acid,or whatever other material it may be which forms the the *materies morbi* in this disease; and, although, in these cases we have not the acute endocardial or pericardial affections which are apt to occur in rheumatic fever, the heart's power is very apt to be weakened, as if the nutrition of its muscular structure were much enfeebled, or from chronic valvular disease interfering with the circulation through the heart. Intermission of the pulse is a frequent symptom of a gouty state of the system; nor is it by any means a necessary attendant upon valvular disease, but will manifest itself in cases where the valves are perfectly sound. In such cases it would seem to arise from some impairment of the innervation of the heart or of the muscular force of the heart—due, probably, to the depressing influence of the gouty poison.

Thus, then, I would lay it down that in the rheumatic and gouty forms of delirium, the disturbance of the brain's function is due to the depression of the hearts action, caused by inflammation in the one case, and by the depressing influence of the poison of gout in the other. The state of brain which causes delirium in these cases is a state of irritation arising not from sympathy with the inflammatory irritatian of the heart, but as Dr. Watson and Dr. Burrows express it, from a disturbrance of the cerebral circulation occasioned by embarrassment of the heart's action; and I would go farther, and say that not only is it due to an embarrassed action of the heart, but to the circulation with diminished force of an impure and impoverished blood through the brain.

And to the same cause—namely, an imperfect supply of blood, and an impure and impoverished state of that blood, and to a consequent exalted or depressed polarity of the nervous centres,—would I attribute all the other abnormal nervous phenomena which accompany these rheumatic and gouty affections; the choreic and the tetanic convulsions,—the coma; for such a view is more in accordance with the production of these affections in ordinary chorea and tetanus, and, on this account, more reasonable, than that which assigns them to a peripheral irritation propagated along certain nerves to the nervous centre in which they are implanted, and also because the evidence to prove that such a peripheral irritation really exists in every case, is very imperfect.

It will be remembered that delirium is apt to take place in rheumatic fever, when the internal inflammation is pleurisy or pneumonia, without any cardiac inflammation. Here the element of the embarrassed heart's action is wanting, unless we suppose that a severe pleurisy or pneumonia would embarrass the action of the heart. And again, it occurs when there has been only slight endorcarditis, and when there has been no internal inflammation at all. So that we may infer, that the element of embarrassed heart's action is less important in the production of the nervous phenomena than that of an impoverished and poisoned blood.

In the delirium of erysipelas and of typhus fever we have the blood poisoned by the erysipelas or the typhus poison, and impoverished during the period of incubation of the poison, and in many instances by influences deleterious to health existing prior to the reception of the poison, which, doubtless, rendered the patient a more ready prey to its destructive power. Hence, then, the pathology of these forms of delirium must be regarded as essentially the same as that of the others to which I have referred. And the more depressed the patient is at the time of the introduction of the poison, and the poorer the condition of his blood, the more likely will he be to suffer from delirium.

It will readily occur to any one disposed to object to these views of the pathology of delirium, that the traumatic delirium is not so readily explicable on these principles. What connexion, it will be asked, is there between a compound fracture, and a poison in the blood? how can a capital operation in surgery develope a poison in the blood?

I think, however, that it may be affirmed that in cases of severe injuries, fractures, burns, and operations, the elements which, in the forms of delirium we have been considering, contribute to the development of the delirious state, are present. Many of the patients who suffer in this way have been free livers, and have had their blood more or less contaminated by gouty or rheumatic, or, in younger subjects, by scrofulous matter. Moreover, the shock of the operation, or other injury, the loss of blood, the confinement consequent upon it, the low diet and antiphlogistic treatment which may have been adopted, enfeeble the heart's action and impoverish the blood. It is well known that traumatic delirium is much more apt to occur in persons who had previously been addicted to habits of intemperance, or in persons of damaged constitution and enfeebled health, than in sound and vigorous subjects.

Pathology of coma.—If these views be admitted respecting the pathology of the principal forms of delirium, there will be no difficulty in determining the true pathology of the corresponding forms of coma, excluding the traumatic variety and that from compression.

We exclude these forms, because their cause is clearly local. In the one case the suspension of the action of the brain is due to the influence of shock on the nervous matter. For a certain time, varying in duration according to the violence of the injury sustained, the vital changes of the brain seem to be suspended; they then recover themselves more or less gradually. A similar phenomenon often occurs in physiological experiments. In pithing a frog, if the operation be done rapidly and roughly the animal remains perfectly motionless for some time, no reflex motion whatever can be excited by any mode of stimulation. The animal lies in this state for a certain time, when its reflex actions return, the paralysing influence of the shock caused by the division of the spinal cord having passed away.

Again, in the coma from a depressed fracture of the skull, or from an effusion of blood or serum, the cause is clearly local, as is shown by the rapidity with which it passes off when a surgical operation has been successful in elevating the depressed and compressing bone, and by the incurability of the cases where a large intercranial hemorrhage is the compressing cause.

But in all the other varieties of coma the close analogy of the clinical history points to a close analogy of cause and of pathology: and this is clearly shown in the toxic delirium and coma.

A poisonous agent capable of exciting delirium, when administered to a certain extent, will produce coma, if given in a larger dose; and it may be stated that *all* the poisons capable of producing delirium will also cause coma. Take, for example, chloroform: in the early stages of its administration we have delirium; in the later, when more chloroform has been given, coma: so, also, alcohol; so, likewise, opium, stramonium; and the same remark applies to all those agents which exercise a direct action on the brain.

Coma, then, is a higher degree of poisoning than delirium. In the latter case the poison simply irritates, deranges the nutrition of the brain, so as to cause an abnormal and irregular mode of action of that organ. In the former case it paralyses.

If, now, we admit the humoral nature of the epileptic and hysteric paroxysms, and that the epileptic and hysteric forms of delirium are the result of a disturbed nutrition of the brain by some poisonous matter in the blood, it is clearly highly reasonable to view these forms of coma as but higher degrees of disturbed nutrition from a larger dose or a greater viulence of the poison.

And this reasoning so obviously applies to the rheumatic and gouty coma, that it would be quite superfluous to occupy time with further remarks upon them.

Only admit the humoral view of the various forms of delirium, which I have described, and the explanation of the corresponding varieties of coma follows as a matter of course.

And I must here observe, in concluding my remarks upon the pathology of delirium and coma, that, so far as I know, no explanation has as yet been given of them, so comprehensive and so accordant with the striking analogies in the clinical history of the various forms of those affections as this, which I may designate the humoral view of the pathology of delirium and coma.

On the Treatment.—I had hoped to have been able to have reviewed the various modes of treatment proposed or adopted for these affections: but the limited space of time allotted to these lectures compels me to confine myself to a very brief reference to one or two important points.

And, first, I would remark that the facts which I have elicited as to the non-inflammatory nature of infinitely the greatest number of cases of delirium and coma, denote how unnecessary is the antiphlogistic treatment in most of them, and how mischievous it may be in most of them.

And, as to the employment of general or local blood-letting, it is a practice not to be justified by anything in the clinical history or the morbid anatomy of these affections, unless perhaps in the truly inflammatory forms, or where some inflammatory complication may exist. I would here remark, that bleeding tends to the production of that state of blood which is favorable to the development of the comatose or delirious states. It has long been recognised by various observations upon the quantitative analysis of the blood, that bleeding tends to increase the water, to diminish the specific gravity of the serum, and to diminish in a very marked manner the amount of the coloured corpuscles,—to induce, in fact, a state of blood highly favourable to the exosmose of its fluid parts among the tissues, and which is apt to produce a special variety of delirium and coma (the anæmic), and which, it is reasonable to conclude, would be very apt to increase the intensity of other forms of delirium and coma.

I was anxious to ascertain the effect of repeated bleedings upon the blood in a case where food had been at the same time freely given; and accordingly I tried the following experiments, with the kind and able assistance of my friend Mr. Lionel Beale. A large and well-nourished dog, apparently in perfectly good health, was fed daily on two pounds of meat and a quart of milk. He was bled on four successive days to the extent of six ounces each day, and the blood carefully analysed. The blood drawn in the first bleeding on the 6th of April contained, in a thousand parts, 142·85 corpuscles, 2·42 fibrin, and 783·79 water. That taken by the second bleeding (on the 7th April) exhibited a diminution of the corpuscles to 113·54, and an increase of the water to 810·89, and of the fibrin to 4·72. On the third bleeding (April 8th) the corpuscles had fallen to 110·58, and the water had increased to 815·18, the fibrin being 4·34. And on the fourth bleeding the corpuscles were 106·96, the water 813·04, and the fibrin 3.99.

Thus, notwithstanding the high feeding, the obvious and marked tendency of the withdrawal of blood from the system is to increase the water and diminish the corpuscles, while the fibrin is evidently not reduced, but rather increased.

So much for bleeding. Generally speaking, however, an antiphlogistic system is inapplicable in delirium and in coma. We have ample confirmation of this in the results of experience in delirium tremens. I believe practical men are now pretty well agreed upon this point. And what applies to delirium tremens applies also to all the forms of delirium. The approach of delirium should be the signal to the practitioner to look to the support of his patient: this is particularly the case in the delirium of rheumatic fever and of gout, and in that of erysipelas and typhus.

I must add one word before I conclude as to the use of opium. In certain forms of delirium, the cautious and watchful use of this drug is of the utmost value; in others it is attended with danger. It appears to me that in those cases of delirium which have a tendency to pass into coma, opium should be avoided, or used with the greatest caution, whereas in the wakeful delirium it is of great value, and may often be employed very freely, not only with impunity, but also with great benefit. In the epileptic and hysterical delirium, and in that from gout, opium, if used at all, must be employed with great caution. On the other hand, in the delirium of rheumatic fever, and in that of anæmia, in the traumatic delirium, and in delirium tremens, it is invaluable, of course with certain restrictions.

I regret that the time allotted to these lectures obliges me to conclude here my rapid survey of the pathology and treatment of delirium and coma. Much more might be added to what I have said, especially as regards the treatment; but I shall be content if I have succeeded in calling the attention of the profession more particularly to the intrinsic nature of these affections,—a subject which does not appear to me to have received from them all the attention which their importance deserves.—*Med. Gazette, May* 31, 1850, *p.* 921.

188.—DISEASES OF THE ARTICULAR CARTILAGES.—By Dr. P. Redfern, Lecturer of Anatomy, &c. Aberdeen.

Before treating of disease in articular cartilages, it is necessary to notice their position amongst the tissues, and their mechanical and vital properties in the healthy state. They are formed of a texture, which, in the purest state in which we see it, consists of a mass of nucleated cells, similar in every respect to those of the cellular textures in plants. Other forms of cartilage have their cells spread out in a granular or fibrous mass, called the hyaline or inter-cellular substance of cartilage. The cells, in every form, are capable of producing others, so that, whilst the old cells are constantly disappearing, others are growing to supply their places; and thus the tissue is continually undergoing important nutritive changes, by which its functions are preserved to the latest periods of existence. Its powers of absorption are very great, and there can be little doubt that, by these, articular cartilages receive a sufficient amount of nutritive material from the blood which circulates in the vessels of the bone or synovial membrane.

In the 'Philosophical Transactions' for 1841, Mr. Toynbee pointed out that the blood-vessels of the bone, near a cartilaginous surface, present certain convulsions, dilatations, plexuses, and other peculiarities, well adapted for the reception of blood, from which the liquor sanguinis may be separated by exudation, for the purpose of nourishing the cartilage. He showed, also, that these vessels are separated from the cartilage by "a lamella of bone, composed of two sets of osseous layers; the one, dense and thick, is continuous with the vertical fibres of the cancelli; the other, delicate and thin, principally composed of osseous corpuscles, is situated at right angles to the latter, and fills up the interspaces of the vertical fibres."

Mr. T. believes the articular cartilage is chiefly nourished by exudations from the above-named blood-vessels, the arrangement of which, with the absence of any other means of nutrition, have led him to this conclusion. He points to the existence of a number of osseous lucanæ, without other openings or canals, in the articular lamella of the bones; and to a series of minute canals, situated in the deeper parts of the cartilage, and leading towards the free surfuce, as means whereby the passage of nutritious fluid from the blood-vessels of the bone into the substance of the cartilage may be facilitated. In the fibro-cartilages, Mr. T. states, that the blood-vessels uniformly terminate within the boundaries of the fibrous tissue, without passing into the part formed of cartilage. He regards the fibrous portion of fibro-cartilage as formed from the cells of the cartilaginous part, having found that, in the fœtus of three and seven months, the external part of the inter-vertebral substance contains cells elongating into fibres, whilst up to adult age, the changes in it consist in the encroachment of the fibrous portion upon the cartilaginous. It may be noticed here, that Mr. T. also maintains that, during the whole of life, articular cartilages gradually become thinner by being converted into bone.

Dr. Leidy has different views regarding the structure and mode of nutrition of articular cartilages. He describes the cartilage corpuscles as solid nucleolo-nucleated cells lying in groups. The contents of the cells are a translucent, homogenous, or minutely granular substance, with a central mass of distinctly coarser and darker granules, in which a transparent, round, or oval nucleus can be seen, coloured brown by the application of tincture of iodine. He has described and figured the cartilage matrix, as a substance made up of filaments 1-25,000th of an inch in diameter, composed of a single row of granules. These filaments are arranged horizontally at the free surface, but vertically in the deeper parts of the tissue. To this arrangement of the filaments, he attributes the horizontal and vertical arrangement of the cells, which, he says, in being developed amongst fibres, will necessarily extend in the direction in which there is least resistance, in the line of the filaments,—and also the direction taken by fractures in different parts of the thickness of the cartilage. He regards the intra-cellular substance as originating in the exercise of the vital activity of the cells, which accumulate and fix around and within themselves certain matters which they derive from the surrounding nutritive fluids, as happens in the case of many zooid plants,—the cells themselves multiplying by division into masses which ultimately become cells like the former. Dr. L. believes articular cartilage to be nourished by fluids poured out from the blood on its attached surface, and by the *circulus vasculosus* at its circumference, but especially by the synovial fluid, which is rich in albumen, the substance from which he regards it as certain that the tissue of cartilage is formed. Henle noticed the probability of the occurrence of this third mode of nutrition many years ago, but it is difficult to conceive that the synovial fluid should serve the purpose of nourishing the tissue, the free surface of which, there can be no doubt, it is intended to lubricate. Again, the synovial fluid is deficient in potash, magnesia, and sulphuric acid, which are found in cartilages; and, moreover, the costal and many other cartilages are certainly not nourished by it. The filamentary arrangement of the molecules of the healthy inter-cellular substance is important, as it is shown, by the preceding observations, that, in the most frequent changes to which articular cartilages are liable under the influence of increased or anormal nutrition, the hyaline substance on the surface splits into bands and fibres parallel to it; whilst, in the deeper parts, these are always arranged more or less vertically.

It was noticed by Mandl that the nuclei of fibro-cartilages more frequently contain fatty matter than those of true cartilages; and Henle remarks that whenever fibres become developed in the inter-cellular substance of certain cartilages, the nuclei of their cells become converted, in great part, into fat, as if the two processes were connected with each other, whilst the cytoblasts never contain fat in those cartilages which do not become fibrous. The latter author also adds, that whilst fibres are frequently found in advanced life, in those cartilages which have a tendency to ossify, he has never seen a trace of fibre in those which do not ossify, as the articular cartilages and those of the nose.

So far as I am aware, the actual conversion of the hyaline substance of articular cartilage into fibres, in disease, has not been previously demonstrated, though the external appearance of such cartilages is sufficient to lead to a suspicion of its occurrence. In many of the states of disease which have been described in the preceding observations, the fusion of the walls of the old cells with the intercellular substance, and the division of the gelatinous cell-contents into as many pieces as there are corpuscles or nuclei in the interior, were seen to take place much more evidently than they ever are in the healthy state, proving that this is one very important mode in which new cells are formed and the old ones removed from the tissue.

The most important uses of articular cartilages are mechanical. They constitue a beautifully smooth and highly elastic covering for the ends of the bones, thus facilitating motion, and decomposing a large portion of the forces which would have produced repeated fractures, had they been applied directly to the bones. But, as these textures are subjected to great friction, they would wear away gradually, but for the constancy of their nutritive changes, which are sufficient to prevent this, as is shown in the fact that the cartilages are not thinner in individuals, or in particular limbs that are most unceasingly employed, than in others, and that, though the cartilages are a little thinner in old than in young persons, the difference has never been shown to result from friction, nor to exceed in amount similar changes known to take place in other textures as age advances. Again, the elasticity of most, if not of all substances, is impaired by constant use, in which we see an additional necessity for the constantly recurring changes in articular cartilages. The fact being certain, that important nutritive changes do constantly take place in these textures, it is surely inconsistent with true pathology to conclude that they are not likewise subject to anormal nutritive changes, similar to those from which all other textures are known to suffer. And yet, the argument can have no weight without the support of numerous and well-ascertained facts.

Mr. Birkett, following out Richet's view, has endeavoured to show that bone and cartilage in their relations to each other are similar to true skin and cuticle. To prove this, however, appears to me to require some explanation—why the cells of cartilage should so readily produce others, when no single epithelial cell can perform a similar function;—why articular cartilage is never reproduced, whilst cuticle and epithelium are replaced more readily than any other tissues in the body;—why, when there is a very obvious chemical difference in the deep and superficial layers of cuticle, no such difference can be shown in the parts of articular cartilage;—and why the deep cells of cartilage are arranged in perpendicular columns, and the superficial ones horizontally to the surface, if they merely constitute a simple epithelial layer.

It is important to notice that no nerves enter into cartilages, and that nothing is known of their existence in fibro-cartilages, in which we might have expected to have found them, in connection with the fibres. Such structures are not sensitive, as has been shown by numerous observations and experiments, and yet it is generally believed that, in disease, they cause such acute pain as exhausts the patient.

Morbid anatomy.—Hypertrophy, or an actual increase in the substance of the cartilage, occurs occasionally, without any obvious change in the texture, though it is generally accompanied with a soft, spongy, and decidedly diseased condition.

Softening is generally very evident to the naked eye. The texture of the part so diseased is pulpy, and resembles a portion of soft fibro-cartilage. For microscopic examination, sections are difficult to be obtained, and the part requires slight separation with needles,—the hyaline substance is dark and indistinctly granular or fibrous,—the cells are enlarged, and contain a number of other cells or nuclei;—in many parts, the dark fibrous mass contains corpuscles or small cells, which appear to have been set free by the bursting of larger ones.

Atrophy is seen in old people, in whom it is found affecting a whole surface or particular parts. If affecting particular parts, there are generally traces of the former existence of other disease; but when it is thinner than usual over the whole surface, its structure appears healthy.

Ulceration is found involving whole surfaces, the cartilage being soft, velvety, and abraded;—more frequently, such changes are found in the central parts of the cartilages alone, the circumferential part being white, dense, and generally split by numerous small fissures; or a small spot of the size of a split pea may be the only part affected, and may present an irregularly rounded and excavated spot, the margins of which are fringed by a multitude of projecting bands and fibres, the deepest part being also covered with similar processes. Again, limited depressions occasionally exist, and appear as smooth as if portions of cartilage had been scooped out:—in more active forms of disease, the cartilage is removed very rapidly, and, on examination, a few patches here and there may be the only traces of its former existence. Such patches are generally reddened;—their surface, though not perfectly smooth, may yet be glistening, and their general appearance is often such as might lead to the impression, that they are portions of tolerably healthy cartilage, which have been left after the absorption of the other parts. The whole surfaces entering into the formation of a joint, or particular parts of the same, are not unfrequently found covered with fibrous and projecting fringes in advanced life. These are best seen on immersing the surface in water, when the fibrous processes float out, and may be carefully examined. They are of all sizes and lengths, attached at one end to the surface of the cartilage, and free at the other. They are found most frequently on the cartilages of the patella and trochlear surface of the femur, the substance of these cartilages, at the same time, being apparently healthy, as far as can be ascertained by the naked eye.

The process thus spoken of as ulceration may commence at any part of the cartilage,—on either of its surfaces, or in its very substance, though its favourite seat is the free surface, from which it gradually extends to the deeper parts, destroying them as it meets with them, and at last, leaving the bone completely bare.

Whatever external appearance the disease presents, the structural changes are found to be similar, in all cases, on a microscopic examination. These consist of changes in the structure and arangement of the cells, and of others in the hyaline, or inter-cellular substance. In very active forms of disease, the changes in the inter-cellular substance are little observed, owing to its rapid disintegration, or to its absorption into the cells; whilst, in chronic cases, the splitting of the hyaline substance gives to the surface a character so peculiar and well-marked, that, after repeated microscopic examinations, it is possible to state, on a simple inspection, what changes the structure will be found to have undergone, when more minutely examined.

The first changes which can be noticed in the cells are their enlargement and irregular arrangement in the tissue. Some of the cells under the writer's observation were found to measure 1-100th of an inch in their long diameter, and others were five or six times their usual size, over large portions of many diseased surfaces. They become rounded, oval, or oblong, and very generally isolated and irregularly distributed, instead of being elongated and found in groups which form columns in the deeper parts. If only slightly enlarged, their nuclei remain in small number, and are irregular;—if considerably enlarged, their contents differ entirely from those of healthy cells, and consist of a mass of corpuscles, which are irregularly rounded, oblong, or triangular, glistening on the surface, and varying in diameter from 1-2000th to 1 5000th of an inch, the larger ones being finely granular, or containing a small nucleolus. On tracing sections, containing such cells, towards the surface or diseased part, the cell-walls become indistinct,—patches of corpuscles are met with without cell-walls enclosing them, and the corpuscles are found at length freely mixed with the tissue. These changes are best marked in the deep cells, though they occur also in the superficial ones. The cells of the free surface enlarge and become much further separated from each other, losing their regularity of arrangement. Their nuclei generally disappear, and the whole cell often becomes finely granular, and is reduced io a mere shred of membrane, which is gradually lost. In some places the diseased cells enclose others, of about 1-1400th of an inch in diameter, which are shortly released by the bursting of the containing cells. These smaller cells are full of dark and irregular granules, 1-15000th to 1-5000 of an inch in diameter. They are often found mixed with fibrous tissue, to which they give a dark and indistinct character, as they become gradually lost amongst its fibres. The diseased cells, nuclei, or corpuscles, contain granules under many other circumstances. Indeed, the granules appear of all intermediate sizes up to 1-2000th of an inch, when they are evidently formed of oil, into which the nuclei have probably been converted.

When the disease advances with great rapidity, scarcely any changes can be seen but those in the cells. These become rapidly distended,—their nuclei are converted into granules, and the cells afterwards form a number of cavities in the tissue, the walls of which appear finely mottled—or the cells burst upon the surface, causing it to present a series of cavities; and, having discharged their centents, these enter into the formation of a fibro-nucleated membrane, with nipple-like processes which fill up the opened cells.

The alterations in the hyaline substance consist of a splitting into bands and fibres of all sizes, the smallest fibres being indistinguishable from those of white fibrous tissue. The bands constitute the processes projecting into the joint, loose at one end, and attached to the cartilage at the other. This change was noticed in all the preceding observations. It is not so often seen in acute as in chronic cases, probably, because, in the former, the rapid enlargement of the cells destroys the hyaline substance before it has time to break up into bands and fibres; whilst, in the chronic disease, the structure is not always wholly removed, but converted into the fibrous membrane which covers the bone when ulcers have healed. Wherever the surface presents the velvety appearance, this is found to be due to the splitting of the hyaline substance into fibres and bands. Amongst these, rounded gelatinous masses are at times found, and they are occasionally stuck upon the striated bands, and interrupt their continuity. They have every appeaance of being the changed contents of cartilage cells. The smaller bands are very transparent, and contain no traces of nuclei or cells,—the larger ones have, within them, all the forms of cells and nuclei, which are found deeper in the texture, the most advanced stages of disease in the cells being always found at the part split into fibres. In the parts wholly converted into small fires, traces of the nuclei and cells can generally be seen. Where the bands are connected with the cartilage, enlarged cells or cavities are occasionally found in a position which indicates that they are concerned in causing the splitting; and it is to be noticed, that when the hyaline substance of the original surface of the cartilage splits, its bands and fibres lie horizontally, but when that of the deeper parts undergo a like change, the bands and fibres are always vertical to the surface, the difference being evidently owing to the normal arrangement of the cells of these parts, whether the cells are or are not the immediate cause of the splitting.

The membrane covering the bone at the bottom of old ulcerations which have healed, and that which covers the free surface of cartilages in a chronic state of disease, are of the same character, the latter being only of more recent formation. They consist of dark and very small fibres running horizontally, no nuclei being seen in the parts of old formation until after the action of acetic acid; whilst in other and more recently formed parts, the nuclei are very distinct, in still more recent ones, there is an indistinctly granular and fibrous mass, full of the corpuscles, discharged by the bursting of cartilage cells, and in various stages of elongation.

As long as the cartilage is the only tissue affected, no other structures are found than those which have been named, and no pus is formed. But, whenever the bone or synovial membrane becomes diseased, these parts throw out the usual exudation, in which new structures grow. Upon the synovial membrane, the exudation becomes organised into lymph or converted into pus, or it may be mixed with tubercular granular matter if it be in a scrofulous individual; in the tissuse of the bone, plastic and fusiform cells and primitive filaments are formed in the exuded matters. In all such cases, the new elements just named appear, and have a few changed cartilage cells mixed amongst them.

Disease affecting the articular fibro-cartilages is of a character precisely similar tc that before named, whether the changes in the cells or in the fibrous mass be considered.

Chemistry.—During the occurrence of the above-named morphological changes, there are doubtless many important chemical ones. Thus, the fibres formed from the hyaline substance, are at first rendered transparent, and then almost wholly dissolved, by the action of acetic acid, as is the case with white fibrous tissue, which is known to consist of gelatin; but cartilages contain chondrin. Now, when the complete conversion into fibres has not taken place, and granular cells are mixed with indistinct fibres, acetic acid has less effect in producing transparency and solution, the actual chemical composition of the part probably changing in a direct ratio with the changes of structure.

Similar chemical and morphological changes are found to advance side by side in the conversion of fibrin into pyin, and this into gelatin, during the formation of white fibrous tissue from coagulated blood-plasma. The gelatinous masses, stuck upon the bands in some places, and loose in others, are also the changed contents of cartilage cells. In many places, the nuclei of cells appear to be resolved into fat; and it is curious to notice, that, in the greater number of places where granular cells are found, those are of the size of the compound granular or exudation cells found in diseased states of other tissues; and yet they are not newly formed cells, but those of cartilage changed in character. Another well-marked chemical action is shown in the deposition of a number of masses of carbonate of lime in the very substance of the cartilage; and, should it prove that the crystals of oxalate of lime, found on the surface in this case, were formed during life, the mode of production of the oxalic acid will constitute a very interesting and important object of research.

Pathology.—The essential nature of all the known diseases of articular cartilages, is shown by the preceding observations to be a change in the nutrition of their texture. That any one of these is produced mechanically cannot for a moment be maintained, after a careful examination of the texture of the diseased part. Even the fringed and flocculent appearance of cartilages in chronic disease, is always associated with marked changes in the cells and hyaline substance. And yet it is possible, that, in some cases, the greater amount of pressure thrown on one lower extremity than the other is connected with more extensive disease in the joints of that side. That the disease depends on actions going on in the cartilage, and proper to it, is proved by its frequent occurrence without a vestige of disease in the synovial membrane or bone; and, that all the changes go on independently of any peculiar action in the blood-vessels, is shown by the appearance of the disease on the surface, in by far the greater number of cases, and at parts far removed from the vessels of the bone, or of the synovial or other membrane. Many authors get rid of the "fibrous degeneration of the cartilage," by assigning to it a nature altogether different from that of other processes in the same texture. That it differs thus, is the opinion of Mr. Key, who was the first to maintain that ulceration of articular cartilages results from the absorbing action of a membrane produced on its surface: yet M. Key does not hesitate to state boldly, that after inflammation caused by wounds, the cartilage is often found to be extensively destroyed and the bone laid bare, without any appearance of a membrane for the purpose of absorption. Yet it is certain that in many, if not in the majority of cases of ulceration of cartilages, the process commences without the presence of any membrane whatever; whilst, on the other hand, there can be little doubt that cartilages are very frequently covered by a thickened synovial, or a newly-formed vascular membrane, without any ulceration resulting.

That these processes do not *depend* on the conversion of the nuclei and hyaline substance into fat, is shown by such changes being only occasional ones, the whole substance of the cartilage being very frequently destroyed without the production of fatty granules in a single cell. They can only be referred to an anormal nutrition of the texture, by which the cells become inordinately and imperfectly developed, and the hyaline substance is split into bands and fibres. It will be seen that these statements require to be received as ultimate facts, and that, however inexplicable the nature of the process may appear beyond this, an anormal state of the nutrition of the part, gives us as perfect an explanation of the formation of the diseased textures before named, as healthy nutrition does of the manner in which the texture is preserved in its normal state.

The disease may be acute or chronic. When acute, the changes in the cells are at times the only ones which can be observed, and the whole cartilages of a joint may be removed with extreme rapidity. In two cases, Mr. Mayo saw the articular cartilages of the ankle completely removed within a month after an injury; and after the lapse of two months, in another case, he found that the cartilages had disappeared and that the bones were joined by semi-transparent and organized lymph from 1-6to to 1-4th of an inch in thickness. Mr. Lawrence relates the case of a patient, who died of phlebitis after blood-letting, in which he believes that complete destruction of the articular cartilages of the femur and tibia took place in four days. When the disease is chronic, it may last for years without producing any symptoms whatever: or, it may be the cause of the crackling and grating sometimes noticed in the joints of old people. In some cases I have seen, the patients died of other affections without knowing that disease existed in the joints; and in one case, the nature of the changes were such, as to render it very probable that disease had existed for years, and had been cured, in many places, by the formation of the thin and translucent membrane covering the bone.

Now, if it be true, that disease having the same essential structural characters in all cases, at times goes on to the complete destruction of the texture, without the patient or his attendant being aware of its existence; and, in others, causes such violent pain and hectic irritation in the system as to require amputation, the fact is of extreme importance, as, so far as I know, no similar occurrence takes place in any other texture whatever.

I shall not presume to deny, that uncomplicated disease of articular cartilages produces excessive pain, since this is stated very positively on the high authority of Sir B. Brodie, and by most surgical writers. And yet, on looking over the numerous cases which have been related by Sir B. Brodie and other authors, I find but few which will aid in the determination of the question. Uncomplicated disease of cartilage is of very rare occcurrence, if we exclude the cases of fibrous degeneration; and carefully collected reports of numerous cases, with histological examinations, are necessary to establish a fact so decidedly at variance with everything we know of disease and its characters in other textures. This will appear more evident from the following considerations:—

1st. Nerves have never been found in cartilages, and there is not the slightest reason for believing that they contain any, for they give no evidence of sensibility in man or in animals on being exposed or sliced away. The cuticle, enamel, and the substance of the brain, are in a similar position. They contain no nerves, and give no indications of sensibility, when parts are removed, or otherwise destroyed. Moreover, it is well known to every pathologist, that an immense portion of the whole bulk of the cerebrum may be utterly destroyed by disease, without a single recognised symptom or other mark of the existence of the lesion. Hence the value of pain.

2d. It is certain that disease of cartilages may go on for years, and even be cured by the efforts of nature, without the knowledge of the patient, and that the essential characters of such diseases are similar to those of other diseases of the same tissue, which are supposed to be the cause of excessive and exhausting pain.

3d. The symptoms supposed to indicate disease in the cartilages are so closely allied to those produced by affections of the bones, that a positive diagnosis is very difficult to make until the bone becomes exposed, and then the symptoms are, at least, as easy attributable to the disease in the bone as to that in the cartilage. Indeed, M. Richet, in the work before-named, when entirely ignorant of the real nature of the changes which take place in diseased articular cartilages, gives several good anatomical and other reasons why the symptoms supposed to arise from disease in them should be referred to the bones.

4th. Pus has never been shown to be formed from the substance of diseased articular cartilages, nor from effusions into their texture. At the time when pus is formed in joints, the pain becomes very severe, though there may have been but little previously, the very formation of pus indicating that other textures than the cartilage are affected, and that the pain proceeds from the disease in them.

After ulceration has gone on for a considerable time, the part may be healed without any evident exudation. The structure which is formed, is precisely of the same character as the fibro-nucleated membrane found on the surface of cartilages in a chronic state of disease, and it is probably formed in a similar way to the latter, by such a new arrangement of the particles of the cartilage as converts it into fibrous tissue.

Diagnosis.—Little remains to be said on this head. It has been shown, that in cases of chronic disease affecting every cartilage in both knee-joints, there may not be a single indication of disease. It is generally believed, that ulceration of cartilages is indicated by pains, which are at first sight, and afterwards become excessively severe;—which affect a particular spot, deep in a joint, as well as remote parts of the limb, becoming more severe during the night, and always unattended by swelling for four or five weeks, or even for many months. These pains are always increased by motion of the joint and pressure of the articulating surfaces against each other. At last, the suffering becomes most excrutiating, and is accompanied by painful spasms and starting of the limb during sleep; the patient,s health and spirits fail, and amputation alone can save his life. Sir B. Brodie lays great stress on the character of the pains, and the exhaustion produced by them; on their gradual increase in intensity, and on the occurrence of pains in remote parts of the limb; on the abscence of swelling for a long time, and then on its peculiar character. But the symptoms of disease existing in the bone are so nearly similar, that it is doubtful if all the characters taken together will enable an accomplished surgeon to distinguish the two. It is not at all surprising that, when ulceration has laid the bone bare at a particular part, the symptoms should be so much aggravated, and pus formed, for this is just what we should expect from disease in the bone.

Treatment.—Without a correct diagnosis, the treatment must be empirical, to a certain extent; and directed to the relief of particular symptoms. All diseases of cartilages result from a local or general disorder of the nutritive processes: in the former case, there may be no indications of disease; and in the latter, the bone and synovial membrane are either implicated from the first, or become so subsequently, and the treatment must vary accordingly. Sir B. Brodie places great reliance on caustic issues, and states that they are of greater service in cases where the cartilages are ulcerated than in other diseases of the joints. When the disease is of a scrofulous or tubercular character, there can be no doubt that more benefit is to be expected from constitutional than from local treatment. For all such cases, the ol. jecoris aselli is especially indicated, and local counter-irritation should be used at the same time, at a greater or less distance from the joint, according to the activity of the disease. It is very obvious that whenever the cartilages of a joint have lost their smooth surfaces, perfect rest is essential for a cure; and it should be secured by bandaging according to Mr. Scott's plan, or by splints, &c. This is equally essential when anchylosis is expected; for nothing can be conceived so likely to produce destructive irritation as the moving of two roughened and highly sensitive surfaces of bone upon each other; nor is anything so likely to prevent the organization of the lymph, which may be expected to be poured out in this stage of the disease.

Finally, I may state the following as the conclusions, which appear to be warrantable from the foregoing considerations·

1st. That the whole of the known forms of disease in articular cartilages are connected with changes in the texture, which are essentially similar to each other.

2d. That during the progress of these changes, the cells of the cartilage become enlarged, rounded, and filled with corpuscles, in lieu of healthy cells; bursting subsequently, and discharging their contents into the texture on the surface; whilst the hyaline substance splits into bands and fibres, the changed hyaline substance and the discharged corpuscles of the cells afterwards forming, in many cases, a fibro-nucleated membrane on the surface of the diseased cartilage.

3d. That these changes are alone referable to an abnormal nutrition as their immediate cause, and, in no case, to mechanical or chemical actions, such as attrition or digestion in a diseased secretion.

4th. The most extensive disease may be going on in many joints at the same time, and may proceed to destroy the whole thickness of the cartilage in particular parts, without the patient's knowledge, and whilst he is engaged in an active occupation.

5th. That the disease commences most frequently upon the free surface; but it may proceed from the bone to affect the attached surface, or it may take place in the middle of the thickness of the cartilage.

6th. That it is, at least, very doubtful if the symptoms which are believed to indicate the existence of ulceration of articular cartilages are not really dependent on a morbid change in the bone.

7th. That disease of the whole thickness of an articular cartilage, at particular parts, admits of a natural cure, by the formation of a fibro-nucleated membrane from the substance of the cartilage, without the occurrence of any new exudation.—*Monthly Journal, Dec.*, 1849, *p.* 1279.

A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOREGOING PAGES OF THIS VOLUME; AND SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF YEAR. (ARRANGED ALPHABETICALLY.)

DISEASES AFFECTING THE SYSTEM GENERALLY.

Anæmia.—Give a grain or two of tannin, twice or three times a-day, dissolved in water or any simple vehicle, flavoured with syrup to conceal the taste. The use of tannin does not prevent the employment of other remedies, such as iron, cod-liver oil, &c., but rather promotes their efficacy. (Dr. S. Scott Alison, p. 326.)

Cancer.—When cauterization is employed, it is recommended to perform it thus:—A gelatinous paste having been procured by dropping highly concentrated nitric acid upon lint, a portion of this, of an appropriate size is placed upon the part, and allowed to remain for fifteen or twenty minutes; it is then removed, and the part dressed with lint dipped in a solution of alum. The cauterization is to be repeated daily, first removing the eschar previously made. (Dr. Rivallié, p. 24.)

Dropsy.—*Ascites*—When there are no inflammatory symptoms, and the legs have not become œdematous, methodical compression may be used with the greatest advantage; and it will often be found that diuretics, though previously given in vain, will act beneficially as soon as the employment of compression is adopted.

When considerable ascites occurs with general dropsy, from a watery condition of the blood, and there are no evidences of inflammatory action, give small doses of sulphate of iron with sulphuric acid. It will both act as an unstimulating diuretic, and improve the condition of the blood. (Dr. Dubini, p. 32.)

Fever.—*Typhus.*—"The approach of delirium should be the signal to the practitioner to look to the support of his patient." (Dr. Todd, p. 364.

Intermittent.—The best and cheapest way of giving quinine, is by administering a single ten-grain dose (made into four pills with extract of millefolium) on a day free of fever. (Dr. Pfeufer, p. 36.)

Rheumatism, *Acute.*—Let the approach of delirium be an indication for the adoption of measures to support the strength. (Dr. Todd, p. 364.

Gonorrhœal.—It is very difficult to cure. Give calomel and opium; also iodide of potassium, or liquor potassæ, with remedies adapted to give tone to the stomach. If the patient was taking copaiba, let it be omitted. (Mr. B. Cooper, p. 189.)

Rickets.—in diseases arising from insufficiency of earthy phosphates in the food, give calcined bones in powder; and when there is too rapid elimination of phosphates by the urine, combine with the calcined bones a large proportion of sugar, or add the latter to the food. The sugar will diminish the activity of the nutritive changes which take place in the tissues, and so lessen the amount of matter excreted. But "when a child at the breast is affected with this disease, owing to the poverty of the milk, the mother should take the calcined bones, but without the sugar, in order that the elimination of the phosphates through the milk may not be interfered with." (Dr. Bocker, p. 145.)

Give tannic acid in doses of half a grain or a grain, night and morning, in sweetened water or any simple vehicle, and continue its use for a long time. It acts, in all probability, rather as a tonic and "histogenetic," than by arresting the excretion of lime by an astringent action on the kidney. (Dr. S. Scott Alison, p. 326.)

The indications are, not to cram the patients with preparations of earthy salts, for these are not deficient in the blood,—but to correct disorder of the digestive system, and to invigorate the body by light nutritious diet, fresh air, cold ablutions, and the use of some medicinal tonic, such as quinine or iron. In some cases steel supports are proper. (Mr. G. M. Humphry, p. 184.)

Scarlatina.—Use frequent sponging with tepid vinegar and water, especially in the early stages, when the skin is hot and the pulse accelerated. This measure is very efficacious in preventing the spread of the disease. (Dr. J. Webster, p. 350.)

Scrofula.—Scrofula may arise not merely from deficient nutrition, owing to bad food, &c., but also from "hyper-activity in the nutritive and destructive changes." In the latter case, which may be known by observing the increased amount of excretory products, give a large proportion of sugar with the patient's usual food; sugar having the property of lessening the activity of these changes, and diminishing the amount of excreted products. (Dr. Bocker, p. 145.)

Scurvy.—It would appear from experiments made on board convict ships, that the remedial powers of citric acid and lime juice, in scurvy, are about on a par; and that the good effects of both of them are probably increased by the addition of sugar. As a prophylactic, citric acid has not been fairly tried, but lime-juice with sugar is unquestionably of the greatest advantage. Nitrate of potash would appear not to possess antiscorbutic properties, and not to be adapted either for a prohylactic or a curative agent. (Dr. A. Bryson, R. N., p. 33.)

Suspended Animation.—[An interesting case in which recovery took place after artificial respiration had been kept up for five hours and a half, is related by Mr. T. Small, p. 359.]

AFFECTIONS OF THE NERVOUS SYSTEM.

Chorea.—Give prussiate of iron (ferro-sesquicyanide of iron?) in the following manner:—Take of prussiate of iron, grs. xv.; extract of valerian, grs. xlv.; make it into twenty-four pills. Give one pill three times a day, to be followed by a wine glassful of infusion of valerian. (M. Faivre d'Esnas, p. 96.)

Delirium.—In almost every form of delirium, antiphlogistic measures are unnecessary, or even injurious; and the occurrence of delirium in almost any disease, but especially in rheumatism or gout, erysipelas, or typhus, should be considered an indication that it is necessary to support the strength. With regard to the use of opium,—it should be avoided, or used with the greatest caution, in those cases where the delirium, has a tendency to pass into coma, as in epileptic or hysterical delirium, and that from gout: but in wakeful delirium, such as the rheumatic, anæmic, and traumatic varieties, and delirium tremens, it may be given freely with great advantage. (Dr. R. B. Todd, p. 364.)

Delirium Tremens.—Do not attempt to cure the disease by merely giving heroic doses of opium; but be guided in each case by close observation of particular symptoms. Usually there will be found to be three indications:—viz. 1. To allay the excited nervous sensibility, by reducing vascular action, and by freeing the system from all irritating dieased secretions. For this purpose keep the patient at rest in a partially darkened room, and let him be attended by a judicious nurse. Apply ice to the head, or the cold douche three or four times a day; give tartarized antimony with laudanum and nitrous ether. If there is much biliary derangement, give an emetic; or, give large doses of calomel, with antimonials and opium, followed by castor oil, or stimulating enemata. In very rare cases, where there is much vascular excitement, local or general bleeding may be cantiouly employed. 2. To support the strength by the administration of nourishment, with a moderate allowance of alcoholic stimulants, greater or less, according to the degree of exhaustion of the patient. 3. To remove poisonous elements from the blood by restoring the excretory function of the liver and kidneys. This will be partly accomplished by the means mentioned under the first head; but it is also to be aimed at especially, by the free administration of calomel and diuretics. (Dr. James Bird, p. 60.)

Epilepsy.—Belladonna is very useful in cases where the attacks occur frequently. The dose of the aqueous extract should be at first about a grain and a half, in divided doses; and this may be increased to about three grains daily. (M. Debreyne, p. 77.)

Hysteria.—Marked benefit is derived from belladonna, given as follows:—Take of camphor, 12 grammes (about ℥iij. and gr. v.;) assafœtida, 12 grammes; extract of belladonna, 4 grammes (about ʒi.;) aqueous extract of opium, 1 gramme (about gr. xvss.) syrup of gum, enough to make 120 pills. Give one pill the first day, two on the second, and gradually increase the dose to six pills daily. (M. Debreyne, p. 77.)

Meningitis, *Tubercular*.—When there have been no previous symptoms indicative of a tubercular diathesis, bleeding must be employed, and calomel given. The latter is chiefly to be relied on; but we must not salivate unnecessarily. Cold affusion will be found useful, sometimes availing to arouse the child after the supervention of complete coma. But in the comatose condition, friction of the scalp with tartar emetic ointment, repeated every two hours till pustulation is established, will be of the greatest value. When symptoms denoting general tubercular cachexia precede the cerebral affection, blood-letting, except locally and sparingly, is contra-indicated, and calomel cannot be pushed to the same extent. But the counter-irritation may be employed as in the previous case. (Dr. Hahn, p. 73.)

By judicious management blood-letting may be almost dispensed with, in this, as in most other diseases of infancy. Its effects may be obtained by the use of the warm bath, antimonials, and diuretics, the latter medicines having a very striking antiphlogistic effect: purgatives would serve the same end, but they cannot, except enemata be safely used in many diseases of children. In the more advanced stages, "calomel for the removal of lymph, and iodine (liq. potassa iodidi comp.) for the absorption of effused fluid, are well-known and trustworthy remedies."

It is very difficult in the cerebral affections of childhood, to distinguish cases which require antiphlogistic treatment from those requiring stimulants. The occurrence of febrile disturbance will generally show that active treatment is required; but if the fever is intermittent, leaving the patient depressed in the intervals, we must be very cautious how we use lowering measures. (Dr. E. Copeman, p. 74.)

Neuralgia.—It is of the first importance to pay attention to the state of the digestive organs. Cases apparently most severe and intractable, have yielded almost immediately to the employment of gentle laxatives, such as magnesia with soda and hydrarg. c. cretâ, magnesia with jalap, soda, and a little calomel, or magnesia alone; together with small doses of quinine or bebeerine. (Dr. J. Stark, p. 79.)

Facial.—Use the following ointment:—Extract of belladonna, lard, of each twelve parts, opium, two parts; mix accurately. Let a piece the size of a hazel-nut be rubbed in over the seat of pain for five or six minutes, or until it is perfectly absorbed, three times a day. (M. Debreyne, p. 77.)

Accompanying Herpes Zoster.—Apply a blister near or over the affected part; and when the blistered surface has healed, apply a belladonna plaster. (Mr. E. Humpage, p. 78.)

Give grain doses of oxide of silver, combined with compound galbanum pill and extract of hyoscyamus; and use a liniment containing tincture of arnica montana, tincture of opium, and soap liniment. (Dr. S. Palmer, p. 76.)

Paralysis.—When electricity is employed, begin with a very weak current. Use the interrupted current from the electro-magnetic machine, and after every twenty or thirty shocks, at the most, let the patient have a few moment's repose. Perseverance in the employment of the electricity for a considerable time is essential to success. (M. Matteucci, p. 83.)

Hysterical.—After the general health has been improved by tonics and alteratives, employ galvanism. The *secondary* current is the one which has been employed by the author. (Mr Balman, p. 87.)

Tetanus.—To prevent spasm of the respiratory muscles, it is recommended that the patient should be instructed to respire voluntarily in a measured time, taking as deep inspirations as possible. In order to assist the patient, an assistant should beat time. The patient should be encouraged to persevere in this manner until he falls asleep; and on his waking the same plan should be resumed. (M. Cruveilhier, p. 96.)

Pass a currrent (the *direct* current.) of galvanism through the tetanized limbs. The effect of this, if sufficiently long continued, produces a state of the muscles allied to paralysis. (M. Matteucci, p. 83.)

[A case of idiopathic tetanus successfully treated by galvanism, applied in the form of shocks from an electro-magnetic apparatus, along the spine, over the masseter muscles, and in the course of the great sciatic nerves, is related by Mr. H. Hailey, p. 91.]

Traumatic.—Another case of recovery from traumatic tetanus is reported, in which the inhalation of ether was employed twice a-day. In addition to the etherization, however, the patient was brought under the influence of mercury, strong purgatives were given occasionally, and a belladonna plaster was applied down the spine. (Mr G. H Smith, p. 94.)

[A case of traumatic tetanus in which chloroform was used *without* success, is related by Mr. Solly, p. 92.]

AFFECTIONS OF THE RESPIRATORY ORGANS.

Bronchocele.—A case is recorded which was successfully treated by electro-acupuncture. The number of plates used was from sixteen to twenty, and upon the intervening discs of cloth dipped in an acid or saline solution, a little tincture of iodine was dropped. (Dr. Terzi, p. 85.)

Catarrh, *Chronic.*—In old and weakly people, where there is much expectoration, and when there is no disease of the heart or great vessels, give tannin, one, two, or three grains, twice or thrice a-day. (Dr. S. Scott Alison, p. 326.)

Croup.—Give calomel and alum. To a child seven years old, two grains of calomel and three grains of alum may be given alternately, every hour. (M. Miguel, p. 136.)

When the disease commences as diphtherite in the pharynx, mercury alone is useless, and may indeed be dispensed with, as the local treatment is the most important. The best way is to begin with an emetic of sulphate of copper; then to cauterize the back of the throat well with fuming hydrochloric acid, daily; and to give alum mixed up with honey, every quarter or half an hour. (M. Trousseau, p. 136.)

Epistaxis.—Oil of turpentine will be found an excellent astringent, given in doses of from twenty to sixty minims every three or four hours. Tincture of muriate of iron may be given as an adjunct, or not, according to circumstances. (Dr. T. Smith, p. 116.)

[A new mode of plugging the nostrils by introducing a caoutchouc tube and insufflating it, is mentioned at p. 358.]

Hæmoptysis.—Give oil of turpentine, in doses of from twenty to sixty minims every three or four hours, either simply in water, or combined with infusion of matico. (Dr. T. Smith, p. 116.)

Hiccough.—Preparations of dilute sulphuric acid will be found to act beneficially with great promptitude, in the most obstinate cases. (Dr. Schneider, p 361.)

Hooping-Cough.—Apply solution of nitrate of silver to the glottis and the interior of the larynx, every other day, by means of a bit of sponge firmly sewed on the end of a whalebone rod, shaped nearly like a male catheter. The solution should be, on the average, gr. xv. to the ounce of distilled water, but in some cases the strength may be increased to ℈ij. in the ounce. The only additional treatment requisite, is to attend to the diet, to regulate the bowels, and to confine the patient to a warm and well ventilated room, until the stage of hooping is past; and then, if necessary, to give cod-liver oil, or some other tonic, and to recommend change of air. (Dr. E. Watson, p. 137. Dr. Hislop, p. 139.)

Nostrils, *Foreign Bodies in the.*—It is recommended to close the nostril which is free, and then to blow forcibly into the patient's mouth. By this means the foreign body will often be discharged. (Dr. Homans, p. 199.)

Paracentesis Thoracis.—[An apparatus by means of which the performance of this operation is much facilitated, is described by Dr. G. F. Easton, p. 199.]

Phthisis Pulmonalis.—In the management of persons born with hereditary tendency to phthisis, it is of the greatest importance while adopting proper hygienic treatment for the body, to keep the mind employed in some manner suitable to the tastes and capacity of the individual. Cheerful recreations should be provided, and the powers of neither mind nor body overtasked; but mere amusement will not supply the beneficial influence which is exerted upon the system by active employment of the mental faculties. (Dr. J. F. Duncan, p. 131.)

In any stage of this disease, but especially in the third, when there are cavities, give tannic acid. The dose may be one, two, or three grains, twice or thrice a-day, dissolved in water or any simple vehicle, flavoured with syrup, which will cover the taste. If there is much sweating, add a little dilute nitric acid. Tannin may be given at the same time as iron, cod-liver oil, or any such means. (Dr. S. Scott Alison, p. 326.)

Faulty nutrition is the first element in the production of the disease; and this faultiness consists in an inability of transforming the carbonaceous constituents of vegetable food into fat, or of acting upon the fatty matters introduced into the system so as to render them easily assimilable. The first indication of treatment, then, is to cause a large amount of fatty matter to be assimilated, by giving food rich in fat. In most cases, however, the powers of the stomach and alimentary canal are much enfeebled, and unable to separate this fat from the food. It therefore becomes necessary to give the animal oils themselves, which will readily enter the system, and become assimilated: and this is the rationale of the good effects of cod-liver oil, which can be digested when no other kind of animal food can be taken in sufficient quantity to furnish the requisite amount of fat. The ordinary dose of cod liver oil should be a tablespoonful thrice a day, but it may be abvantageously increased to four, five, or even six. The kind of oil is of no importance except as regards the palate. (Dr. J. Hughes Bennett, p. 127.)

[We are cautioned to take care that the use of cod-liver oil do not cause congestion of the lungs, and so predispose to pneumonia,—by Dr. Besson, p. 356.]

AFFECTIONS OF THE DIGESTIVE ORGANS.

Anus, *Imperforate.*—If it could be ascertained beforehand that the rectum was absent in a case of imperforate anus, it would be easiest to perform

Amussat's operation, and open the colon in the left lumbar region. But as the absence of the lower part of the rectum, or its distance from the surface cannot be known before operating, the perineal incision is the operation that ought to be chosen. One point in the operation ought especially to be attended to, viz., to bring down the mucous membrane of the gut, and fix it to the lips of the external wound, if it be possible to do so. (Mr. J. Erichsen, p. 204.)

Cancrum Oris.—Apply strong nitric acid freely to the edges of the slough, all around, taking care that the little patient takes a full inspiration previous to the application of the acid, so as to obviate the danger of the vapour getting into the lungs; and repeat the application every day, as long as it may be necessary. Put on a linseed poultice, which should be changed twice a day; and detach each slough as soon as it can be done. Let the patient have meat diet, and wine. And give chlorate of potash, fifteen grains and upwards (for children of six or eight years old) daily, in divided doses. (Dr. J. Drew, p. 223.)

Cleft Palate.—In operating for cleft palate, it is recommended to introduce the ligatures by means of small curved needles, held with a pair of dressing forceps, upon the inner surface of each blade of which, a small piece of cork, one-eighth of an inch thick, has been tied. When this instrument is used, the needle can be held at any required angle, and turned in any direction, thus possessing a great advantage over the *porte-aiguille*. An instrument consisting of a slip of cane, about five inches long, armed at the end with a small cork, is also useful; the operator holding it in his left hand, and receiving upon the cork the points of the needles as they are introduced. (Mr. S. Smith, p. 225.)

Constipation.—In constipation from *paralysis* of the intestinal canal, employ galvanism. Bring the conductor from the positive pole in contact with the tongue, and place that from the negative pole, previously covered with a thin piece of cloth, in the rectum, and pass a current through them for about twenty minutes. The patient may not be able to bear a battery of more than about eight pairs of plates. (Dr. Terzi, p. 85.)

In habitual constipation the use of electro-galvanism will be found of the greatest advantage. It not only acts as an aperient for the time, but gives tone to the muscular and mucous coats of the bowels. Its use is not limited to cases of paralysis, but it will be found serviceable in almost all cases except those arising from organic or mechanical causes. (Dr. W. Cumming, p. 156.)

The best way of giving calomel as a purgative, is to mix it with a little table-salt, and place it dry upon the tongue; it must not be combined with any other purgative, and the patient must abstain for some time from taking water and other fluids. (Dr. J. C. Hall, p. 151.)

Diarrhœa, *Chronic*.—When it resists the usual remedies, give tannic acid, two or three grains twice a day, in the form of pill. (Dr. S. Scott Alison, p. 326.)

Choleroid.—Put the patient into a warm bed; apply over the abdomen a large bran poultice, or a patent epithem moistened with infusion of camomile, and occasionally sprinkled with laudanum; and put hot bottles to the feet. Then give about mxv. of rectified oil of turpentine, with a little laudanum or tincture of hyosciamus. One dose sometimes suffices, but if it does not, repeat the medicine. The best way to give turpentine is to put about a drachm of tincture of hop into a wineglass, drop the turpentine into it, and then, *just as the dose is to be taken*, add half an ounce of cold spring water. (Dr. J. J. Trayer, p. 157.)

Infantile.—In *bilious diarrhœa*, with abundant yellow stools, and bilious vomiting, give emetic doses of ipecacuanha, three days in succession. If the ipecacuanha fails, give sulphate of copper every ten minutes, for three or four doses. In addition, give Rochelle salt, sulphate of magnesia, or magnesia alone, or combined with calomel; for instance, give gr. ss. or gr. j. of calomel at night; and gr. iij. or gr. iv. of magnesia next morning. If the stools are green, the same means are applicable, but especially the saline purgatives, as the tartarized soda; and if the stools remain green, after two or three days, it is well to give gr. iij. or gr. iv. of magnesia, with as much sugar; and at the same time to apply poultices to the abdomen, and give enemata.

In *glairy diarrhœa*, give an enema consisting of gr. j. or gr. iss. of nitrate of silver, in a little distilled water, and when it is returned, follow it immediately by a similar one containing a drop of laudanum. Repeat this method daily, for three or four days. If, in this form of diarrhœa, there is flatulent distension and fever, begin with emetics and Rochelle salts, and then give enemata containing sulphate of copper, or sulphate of zinc, twice the strength of those of nitrate of silver.

In *choleroid diarrhœa*, with rice-like stools and collapse, let the child be held in a mustard-bath, till the hands of the person holding it smart much; then wrap it in woollen cloths, and give a little ether and mint-water.—When reaction sets in, give ipecacuanha in emetic doses, and Rochelle salts. If typhoid symptoms come on, and the diarrhœa persists, give enemata of nitrate of silver. Laudanum and astringents are of little or no use in this form of diarrhœa. (M. Trousseau, p. 158.)

Dyspepsia.—In many forms of dyspepsia powdered charcoal is useful, given in doses of a teaspoonful or two before meals, twice or thrice a day. It may be given in the form of pills or lozenges, or made into a paste with water, or spread upon bread. (Dr. Belloc, p. 148.)

Tanic acid is frequently very efficacious, given in doses of one or two grains twice or thrice a day, in water, or any simple vehicle, with a little syrup to cover the unpleasant taste. (Dr. S. Scott Alison, p. 326.)

Flatulent *distension of the abdomen.*—Small doses of the oil of turpentine are of the greatest value in relieving this symptom, whether arising from mal-assimilation of the food in dyspeptic cases, or accompanying obstruction of the bowels, or following operations for hernia. When it occurs in gouty subjects, a mild course of cheltenham salines is an excellent auxiliary. (Dr. T. Smith, p. 151.)

Gastralgia.—In many forms of gastralgia the administration of a teaspoonful or two of powdered charcoal (poplar wood the best) before meals, two or three times a day, is very useful. It may be given in the forms of pills or lozenges, or made into a paste with water, or spread upon bread.—(Dr. Relloc, p. 148.)

Gums, *Spongy.*—Use a garlic containing three or four grains of tannic acid to the ounce of water. (Dr. S. Scott Alison, p. 326.)

Hæmatemesis.—The natural method by which the bleeding is checked, is the contraction of the stomach. Endeavor, therefore, to produce this contraction; and in accordance with the principle adopted, give the remedies as little diluted as possible, so as not to distend the stomach. Oil of turpentine, which will excite contraction of the stomach, and small doses of gallic acid in the solid form, are most to be relied upon. Let the diet be liquid, concentrated, quite cold, and given in very small quantities at once. Ice is objectionable, as distending the stomach; and blood-letting is only applicable in a few cases. (Dr. J. M. Nelligan, p. 362.

Give oil of turpentine in doses of from twenty to sixty minims every three or four hours. It may be given in simple water, agreeably flavoured, or it may be used in combination with compound infusion of roses, iced water, or solutions of tannic or gallic acid. (Dr. T. Smith, p. 116.)

Hemorrhoids.—When there is no inflammatory action present, apply tannic acid made into an ointment with lard (Dr. S. Scott Alison, p. 326.)

[The application of collodion is suggested, with a view of exerting compression upon the tumour by the contractile powers of that agent. p. 197.]

Hernia.—A truss is recommended consisting of an elastic steel girdle of proper form, a hard pad of ivory, wood, or metal, hollowed at its back part, and a spiral spring contained in the hollow at the back of the pad, and acting, therefore, directly upon the latter. The form of the pad is oblongo-oval for oblique and inguinal hernia, egg-shaped for direct inguinal, and triangular for femoral hernia. (Mr. T. P. Teale, p. 206.)

Strangulated. It is recommended to try the following mode of reducing a strangulated hernia:—Let the thighs be flexed and rotated inwards, and the pillow be taken from under the head. Then let an assistant, standing over the patient, raise him by both legs, so as to lift the trunk from the bed, and throw the whole weight upon the shoulders; the surgeon keeping his hand on the tumour, and gently aiding by taxis the return of the bowel. After this posture has been maintained a short time, let the patient be lowered, and if necessary repeat the process. This method is likely to be applicable chiefly to small and recent hernia, and to femoral rather than inguinal. Tobacco, the warm bath, or bleeding, are better laid aside: chloroform is a valuable substitute for these, and opium is also to be approved of. (Brit. and For. Reviewer, p. 220.)

The ordinary operation is that which is applicable to a great majority of cases, including all forms of hernia; but Petit's operation may be kept in view as the preferable alternative, when there is no contra-indication. Petit's operation is specially applicable to femoral hernia, and to cases in which the symptoms of strangulation, though acute, have been of short duration, and the hernia is recent, or, if old, has been small and quite reducible. (Brit. and For. Reviewer, p. 220.)

Melœna.—Give oil of turpentine (which by its stimulant properties will excite the intestines to contract, and so mechanically check the bleeding) and small doses of gallic acid in the solid form. And let the diet be liquid, concentrated, cold, and given in very small quantities at a time. (Dr. J. M. Neligan, p. 362.)

Œsophagus, *Foreign bodies in the.*—Do not use the probang indiscriminately, to push down everything into the stomach. If the substance impacted be meat, or any soft, non-irritating and digestible substance, it is proper to use the probang. But all sharp and pointed bodies should be extracted; and the best instrument for the purpose is a whalebone rod, having at one end a piece of watch-spring, which is connected securely to a flat hook, having a hole in the centre for the attachment of some loops of silk which may aid in entangling the foreign body. If the attempt at extraction is not successful, give an emetic of speedy operation, in the hope that the foreign body may be either expelled completely, or so altered in position, that it may now be easily caught hold of. (Mr. J. Adams, p. 220.)

Prolapsus Ani.—The disease so called generally depends upon morbid enlargement of the mucous membrane of the bowel. It is easily, safely, and effectually remedied by the use of the ligature; in the application of which it is only necessary to remember that the whole of the diseased growth should be comprehended, and that the threads should be drawn so tightly as completely to arrest all circulation through the included parts. (Prof. Syme, p. 215.)

Employ as an injection, a solution of tannic acid in water, three or four grains to the ounce. (Dr. S. S. Alison, p. 326.)

Teeth, *Loosening of the.*—Use a gargle of tannic acid, three or four grains to the ounce of water. (Dr. S. Scott Alison, p. 326.)

Decayed and Hollow Teeth.—Fill the cavity of the tooth, previously well dried, with collodion, which has been allowed to evaporate to the consistence of a thick paste. (Mr. J. T. Davenport, p. 158.)

A composition of gutta-percha, tar, creasote, and lac, is recommended for plugging hollow teeth. This composition is easily softened by moulding with the fingers, is not at all sticky, and again hardens into any shape in which it has been moulded. (Mr. A. Beardsley, p. 196.)

Bleeding after Extraction of Teeth.—[The composition above described is also recommended for plugging the socket in cases of bleeding after the extraction of teeth. p. 196.]

Toothache.—Apply a bit of cotton saturated with a drop or two of strong tincture of capsicum, (Capsic. bacc. ℥iv.; sp. vin. rect. ℥xij.) (Dr. A. Turnbull, p. 262.)

Throat, *Relaxed.*—Employ a gargle made with three or four grains of tannin to the ounce of water. (Dr. S. S. Alison, p. 326.)

Tonsils, *Enlarged.*—Do not remove them by the knife in children, as the operation is troublesome, and sometimes serious; and, besides, they often diminish in size spontaneously after puberty. When the patient is old enough to exercise self-control, the operation is safe enough. (Mr. G. M. Humphry, p. 25.)

Vomiting, *Sympathetic.*—Give iodide of potassium in combination with infusion of quassia; a wineglassful of the infusion with three or four grains of the iodide three times a day. (Dr. A. C. Selkirk, p. 152.)

Worms.—*Tapeworm.*—A new remedy is recommended, consisting of the flowers of a Rosaceous plant termed "Kousso." The infusion, with the powdered flowers suspended in it, is taken in the morning, fasting, and lemon-juice is drunk freely before and after the dose. Cases are related in which this medicine was given with efficacy. (Dr. Budd, p. 153.)

Lumbrici.—A combination of assafœtida with calomel, in the form of pills, has succeeded better than anything in expelling lumbrici. The dose of assafœtida is from four grains to half a drachm. The administration of three tablespoonsful of cod oil, at intervals of an hour, has also been followed by the expulsion of lumbrici. (Dr. Cazin, p. 154.)

AFFECTIONS OF THE URINARY ORGANS.

Albuminuria.—Give gallic acid in doses of eight or ten grains every six hours, in some convenient vehicle; not neglecting the use of other remedies to relieve occasional symptoms. (Mr. G. Sampson, Mr. J. Lyell, p. 173; Dr. S. Scott Alison, p. 326.)

Cystitis, *Scrofulous.*—Be particular to rectify any disorder of the digestive organs, and enforce great care as to the diet. Then give, especially if the urine is alkaline, small doses of mineral acids in bitter infusions; of iodide of potassium; or chalybeates. If the disease is obstinate, apply a perpetual blister, or, still better, insert a seton above the pubes, or in the loins. (Mr. G. M. Humphry, p. 25.)

Diabetes.—It is probable that a deficiency of alkali is the reason why the sugar in the blood is not converted in diabetes, as it is in health, into carbonic acid and water. . This circumstance, then, gives one indication of treatment, and the emaciation and tendency to phthisis lead to another. In the fulfilment of these indications, cod-liver oil and liquor ammonia have been given with advantage; the patient beginning with half an ounce of the oil and five drops of liquor ammonia, thrice daily, and gradually augmenting the dose to five or six times the quantity. (Dr. Bence Jones, p. 164.)

Hæmaturia.—Give oil of turpentine in doses of twenty to sixty minims every three or four hours. It may either be given in water, agreeably flavored; or added to a decoction of uva ursi, chimaphila, or pyrola; or with tincture of muriate of iron. (Dr. T. Smith, p. 116.)

Incontinence of Urine *in Children.*—Examine the urine; and if as will usually be found, it contains lithic acid, adopt the following treatment. Give hydr. c. cretâ. or some mercurial, till the tongue is clean, and the intestinal secretions are healthy, (for they will generally be found disordered.) Then give a little quinine twice a day, before breakfast and before dinner; and give daily, a single large dose of bicarbonate of potash in copious solution, five hours after dinner. Let the quantity and quality of the diet be also carefully regulated. If these measures are adopted, blistering, &c., will seldom be called for. (Mr. J. Simon, p. 242.)

In Adults.—When it is necessary to wear a portable urinal for the purpose of collecting the urine, it is recommended to employ one made of caoutchouc, which fits on to the end of the penis, and retains itself there by its own elasticity. It is of such a size and form as to cause no inconvenience, and can be emptied by means of a stop-cock, without removing it. (Dr. Gariel, p. 303.)

HYDROCELE.—When the iodine injection fails, employ a seton, consisting of one or two threads of dentist's silk. Introduce it by means of a nævus needle, allowing the fluid to drain away through the punctures thus made:—or else tap the hydrocele, pass a needle six inches long, armed with the seton, up the canula, draw it through the upper part of the scrotum, remove the canula and knot the thread. When a sufficient amount of inflammation appears to be set up, remove the seton, and treat the case by rest and antiphlogistic regimen. (Mr. J. Erichsen, p. 240.)

After emptying the sac, introduce through the canula some finely levigated powder of nitric oxide of mercury (quantity not stated.) This plan is quite safe and certain, and is much more convenient and speedy than that of injection. (Mr. Lloyd, p. 242.)

LITHOTOMY, *in Children.*—This operation is not quite so easy as is generally stated, but requires much care and caution. It is necessary to proceed carefully, slowly, and without force, and to recognize the parts with the finger, as the operation proceeds. If care is not used, the parts may be pushed before the finger; and this may be suspected when the finger is found to penetrate to a greater depth than three quarters of an inch or an inch. (Mr. W. Fergusson, 235.)

SPERMATOCELE.—Injection by tincture of iodine (a teaspoonful of the tincture introduced and allowed to remain,) has been found to be both safe and successful. (Prof. Syme, p. 236.)

Injection by tincture of iodine may be practised, and if this is unsuccessful, it will be well to try the following method which has been found successful., viz., after evacuating the fluid, to introduce through the canula a camel-hair brush dipped in tincture of iodine, and to apply it freely to the interior of the serous membrane. (Dr. R. L. Macdonnell, p. 239.)

STRICTURE OF THE URETHRA.—In obstinate cases of stricture, in which the use of bougies fails to effect any permanent good, the contraction returning as soon as the use of bougies is discontinued, divide the stricture by free external incision from the perineum. Proceed as follows:—The patient being placed in the lithotomy position, and put completely under the influence of chloroform, introduce a grooved director, slightly curved, and small enough to pass readily through the stricture. (*For there is no such thing as impermeable stricture,*—no stricture through which instruments sufficiently small, and properly managed, cannot pass.) Then, while an assistant holds the staff, make an incision an inch or an inch and a half long, in the middle line of the perineum or penis, wherever the stricture is situated; the incision to extend through all the structures external to the urethra. Next taking the handle of the director in the left hand, ad a small straight bistoury in the right, with the forefinger guarding the blade, feel for the groove in the director, and push the point into it behind the stricture; run the knife forward so as to divide the whole of the stricture, and withdraw the director. Lastly, pass a No. 7 or 8 silver catheter into the bladder, and retain it there for forty-eight hours- Then take it out, and in eight or ten days pass a moderate-sized bougie, and repeat it once a week or fortnight for two months. (Prof. Syme, p. 226.)

Since the operation of cutting into the urethra is liable to be attended with fatal results, we are not justified in adopting this plan of treatment for the cases in which Mr. Syme recommends it. Incision is only necessary when no instrument can be passed. Other cases, however obstinate and irritable the stricture may be, can be subdued by the use of potassa fusa. (Mr. H. Smith, p. 233.)

In cases of hard and impervious strictures, irritable strictures, and those which have a marked disposition to contraction, apply potassa fusa in the following manner:—Having ascertained *accurately* the distance of the stricture from the orifice of the urethra, and marked it on a soft bougie, insert a small piece of potassa fusa (usually one-eighth or one-sixth of a grain) into a hole made in the point of this instrument, and mould the bougie well round the caustic, so as to prevent it from projecting, and so that it may be more applied to the upper than the under part of the stricture. Oil it well, pass it rapidly down to the stricture, and hold it gently, but steadily, against it for one, two, or three minutes. Do not reapply the potash until all irritation arising from the previous application, has ceased; this may be, in irritable stricture, four days, in some old chronic cases, two or three only. (Mr. R. Wade, p. 234.)

AFFECTIONS OF THE SKIN, &c.

Burns and Scalds.—In burns and scalds of the first and second degree, apply solution of nitrate of silver as directed for erysipelas. See "*Erysipelas.*" (Mr. Higginbottom, p. 250.)

For the suppurating sores which follow extensive burns, one of the best applications is powdered charcoal. If the burn is on the back, the charcoal may be freely strewed over the bed. (Dr. Newmann, p. 260)

Contractions from Burns.—When a web of cicatrix exists in the axilla, or between the fingers, or in similar situations, pass a needle carrying a skein of silk through the base or proximal extremity of the web, and allow the silk to remain as a seton. When sufficient inflammation and induration has been excited, the web may be divided in the usual way with great hope that the contraction will not return. (Mr. W. Fergusson, p. 263)

Chilblains.—Rub the part well with a sponge or piece of flannel saturated with concentrated tincture of capsicum (capsic. bacc. ℥iv.; sp. vin. rect. ℥xij.,) until a strong tingling feeling is produced. Repeat the application daily. (Dr. A. Turnbull, p. 263.)

Eczema.—Give acetate of potash in half-drachm doses three times a day. (Dr. J. A. Easton, p. 245.)

Erysipelas.—In very slight cases, an active purgative and low diet will be sufficient, without any local application. But if there are constitutional symptoms, use such constitutional means as bleeding, emetics, purgatives, calomel, and Jame's powder, and apply nitrate of silver in the following manner:—Wash the part with soap and water, and then with water alone, and dry with a soft cloth; then apply the solution (arg. nit. ℈j.; aq. dest. ℥i.) twice or thrice over the whole inflamed surface, and on the healthy skin around it to the extent of two or three inches. In twelve hours examine the part, and if any spot of inflamed surface is unaffected by the nitrate of silver, apply it again. If the inflammation spreads, repeat the application. If there are vesicles break them, and apply the solution over the denuded part; but do not disturb the vesications caused by the nitrate of silver itself. When erysipelas is spreading to the scalp, shave the head as early as possible, and apply the solution freely all over the scalp. Nitrate of silver may be applied in any period of the disease; and it never causes metastasis. (Mr. J. Higginbottom, p. 250.)

Apply collodion; all over the inflamed surface, daily. It may be safely applied to the head and face. (Dr. J. Snow, p. 257.)

Plegmonous.—Apply a number of leeches to the inflamed part, or make small incisions with a lancet; put on a bread-and-water poultice until the bleeding has ceased, and then apply the solution of nitrate of silver (℈i. to ℥i.) freely upon and beyond the inflamed parts. If suppuration is expected, cover it with a plaster of neutral ointment (a modification of ung. plumbi. co.,) but if not, expose the parts to the air to form an eschar. The constitutional treatment will be ipecacuanha emetics, saline purgatives, and repeated doses of calomel with James' powder. (Mr. J. Higginbottom, p. 250.)

Herpes Zoster.—[For the treatment of the distressing neuralgic pains which often accompany herpes zoster, see "*Neuralgia.*"]

Lepra.—Give acetate of potash, in doses of half-a drachm three times a-day. (Dr. J. A. Easton, p. 245.)

Give phosphorus, or apply it externally. See "*Psoriasis*". (Dr. T. H. Burgess, p. 250.)

Lupus.—Give phosphorus, in the form of phosphorated oil or ether, mixed up with powdered gum and mint water; or apply it externally, in the form of ointment made with camphorated lard. (Dr. T. H. Burgess, p. 250.)

Nævus.—Apply a drop of strong fuming nitric acid, by means of a glass rod, and let it dry on. If the nævus is very small, not even a scar will be left. (Dr. Keber, p. 262.)

Apply collodion, which by its contractile power will exert pressure upon the tumour. (Dr. Brainard, p. 197.)

Pass a flat platinum needle, heated to whiteness, through the substance of the nævus. (M. Lenoir, p. 261.)

Porrigo.—[An apparatus for the purpose of fumigating the scalp in this and other diseases, is described by Dr. T. H. Burgess, p. 259.]

Psoriasis.—Give acetate of potash in doses of half-a-drachm three times a-day. It acts (as described by Dr. Golding Bird) by increasing the metamorphosis of tissue in the system, by which means all products of low vitality are likely to become decomposed and eliminated from the system in the urine. (Dr. J. A. Easton, p. 245.)

Phosphorus is most valuable, either for internal exhibition (in the form of phosphorated oil or ether, mixed up with powdered gum acacia and mint-water,) or for external application, in the form of ointment made with camphorated lard. (Dr. T. H. Burgess, p. 250.)

Scabies.—Smear the parts with lard, night and morning, and cover them with oil-silk. When the hands and wrists are the parts affected, they can be enveloped in oil-silk bags. (Prof. Bennett, p. 258.)

Small-Pox, *To prevent pitting from.*—Apply mercurial ointment thickened with starch, (ung. hydrarg. ℥i; pulv. amyli. ʒij) to the forehead and face, night and morning. The ointment forms a thick hard crust, which, as it cracks and peals off, is renewed by a fresh application. (Prof. Bennett, p. 262.)

Ulcers, *Callous.*—Apply strips of adhesive plaster above and below the sore, and across its middle; strew powdered charcoal freely in the intervals, apply ointment spread on lint, and bandage. Renew this every two or three days. The patient need not be confined to bed. (Dr. Newmann, p. 260.)

[The treatment of various kinds of ulcers by means of nitrate of silver is recommended; but as the details are rather minute and complicated, the reader is referred to the original article by Mr. J. Higginbottom, p. 250.]

Wounds.—[The application of nitrate of silver is also recommended in the treatment of almost every kind of wound,—incised, punctured, contused, lacerated, and dissection wounds. Upon this subject, as on that of ulcers, we must refer the reader to the paper by Mr. J. Higginbottom, p. 250.]

AFFECTIONS OF THE BONES AND JOINTS, &c.

Fracture *of the leg.*—In many cases of fracture of the leg, where there is such a degree of spasm as to cause great difficulty in the treatment, the tendo-Achillis may be divided. (Mr. C. De Morgan, p. 191.)

Of the ribs.—Do not bleed, nor apply a bandage, but give opium freely, and keep the patient at rest. (Mr. Hancock, p. 191.)

Of the Clavicle.—[A new apparatus for the treatment of fracture of the clavicle is described by Dr. J. B. Coleman, p. 190.]

Gangrene.—The first point is to distinguish between constitutional and local mortification. When gangrene is threatened in cases of injury to the main artery of a limb, it may sometimes be prevented by keeping up gentle but continual friction by the hands of assistants upon the lower part of the extremity. In the case of gangrene occurring in the foot after such an injury, a line of demarcation should not be waited for, but the limb should be amputated immediately, below the knee. (Mr. G. J. Guthrie, p. 330.)

Senile.—Give purgatives, and employ antiphlogistic regimen: and apply nitrate of silver at an early period. The parts being moistened with water, and any vesicated cuticle removed, apply the solid nitrate freely on the affected toes, and lightly on the surrounding healthy skin. (Mr. J. Higginbottom, p. 250.)

Joints, *Scrofulous Disease of.*—Secure rest of the joint by plasters, leather or gutta-percha splints, and bandages; but confine the patient to the house no more than is absolutely necessary, or the health will be injured, and the local disease thereby aggravated. Apply tincture or ointment of iodine, night and morning, so as just slightly to irritate the skin; and alternate its use with other stimulating liniments, blisters, or, in slight cases, the cold douche. When abscesses form, allow them to burst spontaneously. (Mr. G. M. Humphry, p. 25.)

Toe-Nail, *Ingrowing of the.*—In order to heal the troublesome ulcer arising from this cause, separate the soft parts from the nail so as to expose the whole surface of the ulcer, and sprinkle it freely with powdered charcoal, mixed with a little acetate of lead or oxide of zinc; bind a piece of lint over it, and let the patient wear a wide shoe, and keep quiet. Every day bathe the toe with tepid water, and sprinkle fresh charcoal over it, without disturbing that previously applied. (Dr. Newman, p. 260.)

A case is related in which the distress arose from a hardened mass of epidermic scales, the size of a sweet pea, placed beneath the nail. On removing this, relief was immediately obtained, and a cure speedily effected. (Mr. J. M'Dougal, p. 357.)

VENEREAL AFFECTIONS.

Bubo, *Non-Virulent.*—If suppuration appears imminent, apply fomentations and poultices; otherwise, apply leeches and evaporating lotions. If, while suppuration is prevented, a permanent indurated condition of the swelling remains, this may result from a strumous habit, and, if so, will yield readily to the exhibition of iodine and iodide of potassium, and proper dietetic management.

Virulent.—Give mercury cautiously, sometimes with iodide of potassium, and do not use any local application which would conceal the characteristic appearances of the ulcerated sore. When the mercury produces the desired effect on the constitution, the ulcerated surface will become healthy, and the characteristic hardness disappear. And until the induration has completely disappeared, the mercury should be perseveringly continued. (Mr. B. Cooper, p. 270.)

Chancre, *Simple.*—When called to see a venereal sore, of only three or four days' duration, apply concentrated nitric acid. But if a sore has all the appearances of true chancre, begin by using constitutional treatment,—giving five grains of blue pill and a quarter of a grain of opium night and morning. So long as the patient is taking mercury, apply no local remedy whatever, and then the sore will furnish, by its appearance, the best possible indication of the effect which the medicine is producing.

Irritable.—Apply nitrate of silver to the sore, and give repeated doses of opium. If when the irritability is subdued, induration remains, give mercury, as in a simple case. In some instances of irritable chancre, calomel and opium will answer as well or better than opium alone.

Phagedenic.—First evacuate the bowels, and then give repeated doses of opium. and apply soothing fomentations. If the vital powers are depressed, give bark, ammonia, and even wine; but if there is a plethoric condition, adopt antiphlogistic measures. If the progress of the ulceration is not checked, apply concentrated nitric acid.

Gangrenous.—Keep the patient in the recumbent posture, and after evacuating the bowels, give ammonia, bark, or serpentary, with wine or porter; and apply black wash, nitric acid lotion, stale beer grounds, or stimulating poultices. (Mr. B. Cooper, p. 269.)

When the healing of chancres on the penis is interfered with by the occurrence of erections, give five or ten grains of lupulin at bedtime, and repeat it if necessary. (Dr. Page, p. 270.)

Condylomata.—Those condylomatous growths arising about the perineum, scrotum, and anus, in old cases of gonorrhœa, may generally be cured by the application of yellow wash. (Mr. B. Cooper, p. 250.)

Gonorrhœa.—Begin by giving purgatives, and nauseating doses of tartarized antimony, and when the inflammatory symptoms are relieved, give the following mixture:—℞. Bals. copaib. ℥ss.; pulv. cubebæ. ℥ss.; liq. potassæ, ʒiss.; mucilag. acaciæ, ℥ss.; aq. destil. ℥viss.; M. Two tablespoonsful to be taken twice a day, as at eleven and three o'clock, but not upon an empty stomach. When the inflammation is severe, employ emollient injections into the urethra; also sedative injections, such as liq. plumbi. diacet. ♏xx. in ʒiss. of water. In mild cases, and in constitutions that are not irritable, stimulating injections may be used, such as hyd. bichlor. gr. i. in ʒviij. of water. (Mr. B. Cooper, p. 270.)

The occurrence of that very unpleasant attendant upon the acute stage of gonorrhœa, chordee, may be completely prevented by giving lupulin. The same remedy is successful in relieving that pain in the perineum which often occurs in chronic gonorrhœa. It is given in doses of from five to ten grains at bed-time, in the form of pill or powder, and repeated if necessary. (Dr. Page, p. 355.)

When the inflammatory symptoms have subsided, gallic acid may be given, in doses of twelve grains, five times in the twenty-four hours. (Mr. Sampson, p. 173.)

When the inflammatory stage has passed, apply, externally, a lotion containing three or four grains of tannin, to the ounce of water. (Dr. S. Scott Alison, p. 326.)

Warts.—If they are pedunculated, employ the ligature; in other cases, apply caustic or powdered savine. If these means are insufficient, excise the warts with the knife, and apply caustic to the cut surfaces. When there is phymosis with warts, the prepuce must always be laid open immediately. (Mr. B. Cooper, p. 270.)

AFFECTIONS OF THE EAR.

Eustachian Tube, *Obstruction of the.*—To ascertain the condition of the eustachian tube, it is recommended to use an instrument resembling a flexible stethoscope, one end of which covers the auricle of the patient, while the other is received into the ear of the surgeon. When the instrument is applied, the patient is to make a forced expiration; and by the sound produced, the surgeon judges of the patency or obstruction of the canal. (Mr. Harvey, p. 271.)

[An instrument similar to the one above described, except that the end of the tube is inserted into the external meatus of the patient, instead of surrounding the meatus, is recommended for the same purpose by Mr. J. Toynbee, p. 272.)

Meatus Auditorius, *Foreign bodies in the.*—Do not attempt their extraction by forceps or director, but use a syringe large enough to hold two or three ounces of water. If such a syringe is used, and the water injected with considerable force, the foreign body may always be removed from the meatus, and that without risk of injuring the wall of the canal or the membrana tympani. (Mr. J. Toynbee, p. 372.)

MIDWIFERY AND DISEASES OF WOMEN.

Abortion.—After abortion has taken place, and especially if with a large loss of blood, the administration of a starch enema containing opium, every night or oftener, has the best effect in allaying excitement, and tranquilizing the circulation. (Dr. J. C. Lever, p. 305.)

In a case of abortion at the sixth week, the administration of chloroform has been successful, in causing dilatation of the os uteri. (Mr. I. B. Brown, p. 363.)

In abortion during the early months, the ovum can always be got away by giving a stimulating enema, such as turpentine. (Dr. Tyler Smith, p. 363.)

Habitual.—When there is no local or general plethora, but the disposition to abort depends upon weakness of the uterine system, give savine; an infusion being made of from two to four drachms to six ounces of boiling water, give a table-spoonful morning and afternoon, in the intervals between the menstrual periods; rest of the uterine and general system, and regulation of the diet, being also enjoined. If, in addition to the uterine weakness, there is augmented irritability and contractility, give ergot of rye in conjunction with the savine. (Dr. Metsch, p. 308.)

In cases of habitual abortion, occurring in women of weak and irritable fibre, and without vascular congestion, the administration of assafœtida as soon as pregnancy occurred, has been very beneficial. (Brit. and For. Reviewer, p. 309.)

Dysmenorrhœa.—The inhalation of chloroform is a valuable means of relieving the pain. The chloroform should be inhaled at bed-time, and then, if the patient remains perfectly quiet on recovering consciousness, she will have a good night's rest. (Dr. J. Henry Bennet, p. 315.)

Labour, *Use of Chloroform in.*—The careful inhalation of chloroform is quite innocuous. It may therefore be given in *natural labour*, simply for the purpose of allaying pain, *if the patient requests it.* And it ought to be given when the regularity and efficiency of the pains are interfered with by emotion, nervous excitement, as cerebral congestion. In all such cases the inhalation must only be carried to the extent of allaying pain,—not to make the patient unconscious. In *operative* midwifery, chloroform should be given in difficult cases of turning, and of retained placenta; and the full surgical effect, of unconsciousness and muscular relaxation, should be produced. In forceps and craniotomy cases chloroform should not be used. (Dr. J. Henry Bennet, p. 315.)

Chloroform may be given safely and with propriety in natural labour for the purpose of subduing the pain, which may be accomplished without taking away the patient's consciousness, or causing the least interruption to the action of the uterus. In operative midwifery, enough should be given to produce unconsciousness. It is absolutely necessary, however, to ensure success and safety, that the chloroform should be pure, and that close attention should be paid to the symptoms which the inhalation produces. It is advisable also to use an inhaler, that of Dr. Snow being one of the best. (Dr. Murphy, p. 315.)

Chloroform ought never to be used either in natural or in instrumental labour. The only cases which can *justify* its employment are:—1. where there is extreme nervous excitability; 2. where there are severe muscular pains in the neighbourhood of the uterus, interfering with its action; and 3. in very difficult cases of turning. And in the two former cases chloroform, if used at all, should be given to such an extent as to diminish sensation, not to produce insensibility. (Dr. Waller, p. 315.)

Leucorrhœa. Give tannic acid, two or three grains twice a-day, dissolved in water, with a small quantity of dilute nitric acid. (Dr. S. Scott Alison, p. 326.)

Menorrhagia.—Give two or three grains of tannin, dissolved in water, together with a small dose of dilute nitric acid, twice a-day. (Dr. S. S. Alison, p. 326.)

In extreme cases, when it is necessary to plug the vagina, use a little caoutchouc bladder, which can be introduced into the vagina, and then inflated by means of a long tube attached to it, so as to exercise the necessary amount of compression. (Dr. Gariel; M. Diday; p. 302.)

Nipples, *Sore.*—Apply lycopodium powder mixed with a little oxide of zinc. It must be powdered well over the part after every time the child sucks. (Dr. Newmann, p. 260.)

Ovarian Disease.—A new operation is recommended, which is thus performed:—Make an incision about three inches long in the direction of a line drawn from the umbilicus to the anterior superior spine of the ilium, and dissect carefully down to the peritoneum. Make a second incision about one and a half inch long, at right angles to the first, and again dissect down to the peritoneum. Introduce a trocar at the point of the angle, and draw off the fluid. Then divide the peritoneum, and reflect it back; stitch the cyst to the tendon of the external oblique, so carefully as to prevent any escape of fluid into the peritoneal cavity; withdraw the canula, and make a larger opening into the cyst with scissors; lastly, introduce a pledget of lint soaked in oil, and apply adhesive straps round the abdomen to keep up gentle pressure. (Mr. I. B. Brown, p. 301.)

Polypus Uteri, *Intra-uterine.*—When the symptoms afford reason to suspect the existence of a polypus concealed within the uterus, the diagnosis may be rendered certain by the dilatation of the os and cervix uteri, by means of sponge-tents. The tents recommended are of a conical form, and are introduced by the aid of a director resembling the uterine sound. Usually a single tent, applied for twenty or thirty hours, opens the os and cavity of the cervix sufficiently to allow an examination of this part by the finger. In order to examine the cavity of the body of the uterus, it is necessary to employ a series of tents for several days, taking care to pass them within the os internum. When the presence of a polypus is ascertained, if it be gradually but certainly making its way downwards, and the hemorrhage and other symptoms are not urgent, wait for its descent through the os, before attempting its removal; facilitating its passage by the dilation of the os and cervix with sponge-tents, and by the internal use of ergot. But if there is too much hemorrhage to wait, or if there is no likelihood of the tumour's descent, proceed forthwith to remove it. With this object, first dilate the os uteri further; then if the polypus is large, divide the pedicle with very curved blunt-pointed scissors, or with a silver wire passed round it and tightened by means of a screw; or if these means are inapplicable, contuse and crush the tumour by a pair of lithotomy forceps, or similar instrument. Or, if the polypi are small and vesicular, (in which case they are generally numerous, and situated in the cavity of the cervix), remove those that are fully formed and pediculated, by the scissors, or by scratching them off with the nail; and destroy those that are not completely developed, but are imbedded like peas in the mucous membrane of the cervix, by the application of potassa fusa. (Prof. Simpson, 275, &c.)

Premature Labour.——The following method proposed by Kirnsch and

Cohen, has been successful in inducing premature labour:—Pass the nozzle of a large syringe, containing 11 or 12 oz. of water, at 92° F., half an inch within the cervix, and inject the water with some degree of force for a number of times (*e. g.* eight or ten, up to seventeen times); and repeat this process twice a-day until labour is induced. (Dr. O. Naegele, p. 308.)

Prolapsus Uteri.—A good supporter is obtained by a modification of the T bandage, in which the perineal straps cross each other, and fasten on the opposite side to that from which they spring. Sometimes a pad may be interposed between the perineum and the straps. (Dr. Blundell; Mr. T. W. Nunn; p. 303.)

[A new kind of supporter is also described by Mr. P. Mageniss, p. 304.]

Puerperal Convulsions, *Anæmic.*—While stimulants are given, and the contraction of the uterus is secured, give opium, which will act like a charm.

Hysterical.—In this form of convulsions, which occurs chiefly during pregnancy, great benefit will result from the administration of a mild opiate as soon as the paroxysm is over. (Dr. J. C. W. Lever, p. 305.)

Retained Placenta.—When it is necessary to extract the placenta, give chloroform, to the extent of producing unconsciousness and muscular relaxation. (Dr. J. Henry Bennet, p. 315.)

Rupture *of the Uterus.* Give full doses of opium at intervals for several days. A case so treated has recovered, though the rupture was so extensive that the hand could be passed into the cavity of the abdomen. (Dr. J. C. Lever, p. 305.)

Turning.—In cases where there is any difficulty, the process is much facilitated by giving chloroform. It should be given to the full surgical extent, so as to produce unconsciousneas and muscular relaxation. (Dr. J. Henry Bennet, p. 315.)

Vagina, *Plugging the.*—The vagina may be easily and efficiently plugged by means of a little bladder of caoutchouc, of suitable form, introduced in a collapsed state, and then inflated by means of a long tube attached to it.—(Dr. Gariel, p. 302.)

Vulva, *Prurigo of the.*—In severe cases of prurigo of the vulva, vagina, or cervix uteri, brush the affected parts over with hydrocyanic acid, the strength of that of the Edinburgh Pharmacopœia. (Dr. Simpson; Dr. Pattison; p. 289.)

MISCELLANEA.

Adhesive Plaster.—An excellent adhesive plaster, unirritating to the skin, not acted on by water, or the discharges from the wound, and possessing all the good properties of collodion except its want of color, with the additional advantage of being cheaper, is made by dissolving, with the aid of a moderate heat, gum lac in spirit of wine, in sufficient quantity to make it of the consistence of jelly. It can be kept in a wide-mouthed bottle, and spread with a spatula as required. (Dr. Mellez, p. 358.)

Caustics, *New.*—For cauterizing the uterus, employ cylinders of potassa-cum-calce, made with two parts of potassa to one of lime fused together and run into iron moulds. While this preparation is quite as powerful as pure potassa, it may be used with much greater ease and safety, as it does not deliquesce like the latter. (Dr. J. Henry Bennet, p. 293.)

For the purpose of cauterizing cancerous tumours, &c., use a preparation made by gradually dropping a certain quantity of highly concentrated nitric acid upon lint, until a gelatinous paste is formed. A portion of this paste is to be applied upon the part until an eschar is formed. (Dr. Rivallié, p. 24.)

Chloroform.—A good sign of the production of insensibility is, a kind of trismus which affects the elevator muscles of the jaw, so that the teeth are pretty firmly pressed together. (M. Dudart, p. 364.)

Collodion.—Collodion, prepared in the following manner, is better adapted for some purposes than that made in the ordinary way:—Mix 4 lbs. of nitrate of potash with 8 lbs. of sulphuric acid in a glazed vessel, add the cotton, and agitate for half an hour with a glass rod; then wash and dry the cotton very carefully. Dissolve 1 oz. of this cotton in 16 fluid ounces of rectified sulphuric ether, and when dissolved, add 1 oz. of absolute alcohol. When the solution has stood twenty-four hours, it will be ready for use. A little of this collodion, allowed to evaporate till it becomes of the consistence of thick paste, answers well for stopping teeth. (Mr. J. T. Davenport, p. 358.)

Lint.—A preparation termed "black lint" is recommended as an application to various kinds of ulcers, &c. It is prepared by saturating an ounce of fine lint in a solution of ʒij. of nitrate of silver to ℥iv. of distilled water, and exposing the lint to dry, by evaporation, in a flat, shallow vessel. (Mr. J. Higginbottom, p. 250.)

[An improved kind of lint, named "golden flax lint," is described with great commendations at p. 356.]

Pessaries.—A new form of pessary is recommended, consisting of a bladder of caoutchouc, which is introduced into the vagina, and then inflated to the proper degree. (Dr. Gariel, p. 358.)

Semola.—[A new preparation of wheat flour, containing between fifty and sixty per cent. of gluten, together with pure wheat starch, and forming a highly agreeable, digestible, and nutritious kind of food, suitable to cases where unstimulating, but at the same time highly nutritive diet, is required; suitable also, it is probable, to the special case of diabetes—is described under this name by Mr. Lloyd Bullock, p. 350.]

Vaccination.—Make at least six punctures, each produced by carrying the point of a lancet, held flat to the arm, obliquely downwards through the cuticle into the surface of the cutis. If possible, use fresh lymph; and never take lymph from a vesicle after the eighth day. Let the instrument used to apply the lymph remain inserted a few seconds, and then be wiped upon the orifice of the puncture. Lastly, if the development of the vesicles is not satisfactory, or if there is only one vesicle, use Bryce's test to try the efficacy of the vaccination. It consists in inserting fresh lymph on the evening of the fifth, or morning of the sixth day; then, if the second vesicle progresses rapidly, and overtake the first, it will show that the vaccination has been successful. (Dr. W. S. Oke, p. 36.)

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THE

RETROSPECT

OF

PRACTICAL MEDICINE & SURGERY,

BEING

A Half-Yearly Journal,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

Edited by
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PRACTICAL MEDICINE.

&c., &c.

DISEASES AFFECTING THE SYSTEM GENERALLY.

ART. 1.—ON MORBID POISONS.

By JOHN SIMON, Esq., F.R.S., Surgeon to St. Thomas's Hospital, &c.

By *morbid poison* we understand a product, which is the supposed specific cause of certain specific diseases; of syphilis, for instance; of scarlatina, of typhus, of glanders, of small-pox, of hydrophobia, and the like;—a product, which has many striking differences from all other poisons, but chiefly these: first, that while other poisons (oxalic, or hydrocyanic acid, or sulphuretted hydrogen gas) act directly in proportion to their dose, becoming more or less deadly in proportion as more or less of them is brought to bear on the organism; you may observe, contrariwise, that the *morbid* poison (the poison of contagion) produces its characteristic results, when given in the minutest conceivable doses, just as surely, and just as deadly, as when the system is saturated with it:—and secondly, that while common poisons diminish from the body, or at the most remain stationary, during the production of their effects, morbid poisons apparently undergo, within the body on which they act, a striking and singular increase.

The phenomena which follow infection with a morbid poison consist of certain local changes, attended by a peculiar constitutional state. The *local* changes may be generalised as sub-acute inflammatory processes, attended (perhaps preceded) by the deposition of a *specific material*, which material in most cases contains an agent capable, by inoculation, of producing in another person the same symptoms as have attended its own generation in the original sufferer. The peculiar *constitutional* state is one essentially of depression; modified no doubt, and intermixed with those phenomena of reaction which the living body (like a spring) always opposes to the direct pressure of exterior influences.

Of the local charges, partaking of an inflammatory character, our memory can give many illustrations: such are seen in the pustules of small-pox; in the cynanche and erythema, and kidney affection of scarlatina; in the intestinal ulcers of typhus; in the catarrh and eruption of measles; in the rupia or periostitis of syphilis; in the swollen parotid of mumps; in the dysentery of malarious fever: in suppurating tumours of glanders; and in various other symptoms that might be quoted.

And it is because of these local differences in *effect* that we are impelled to distinguish the *causes*, and to speak of them as *specific:* syphilis never produces ulcers in the ileum, scarlatina never causes iritis; the causative poison of the one disease differs from the causative poison of the other, for on the self-same subject it produces different effects.

[But there is probably a *material* in the system, or in the blood, upon which the morbid poison may act.]

What this material—the principle of infective disorders in the human subject—may originally have been, we are totally unable to say, but whatever may have been its first method of generation, we can now confidently speak of it as a possible product of the human body; we know that it is liable to develope itself out of some constituent of the human blood.

What are these constituents? Observation and argument sufficiently show, that the blood corpuscles and albumen can hardly be the constituents in ques-

With respect to other alleged predisponent causes, I incline still more strongly to the view already expressed in regard of atmospheric influences, that they can operate only indirectly, only by means of those specific blood-products which constitute the true predisposition in each case. If fatigue predisposes to a particular infection, it can hardly be for any other reason than that the fatigued organ furnishes the material permissive of infection. If errors or insufficiencies of diet, or certain courses of medicine should be found to form a predisposition to certain infectible disorders, their mode of operation could scarcely be otherwise, than by increasing the formation, or diminishing the discharge of that blood product, which is the immediate object of attack to the zymotic poison.

Therefore, as respects those instances of human morbid infection with which we are best acquainted, we may recapitulate our facts, and state our theory, in the following terms: that certain materials of the blood—materials not essential to the performance of its nutritive functions, are, by certain circumstances, rendered liable to undergo definite and specific changes; under the influence of which they become determined, with increased rapidity, to the outlets of the body, and irritate these outlets in their passage; that these changes continue, until the materials affected by them are completely exhausted from the blood; and that the severity and duration of those changes is in proportion to the quantity of material seeking elimination: that the new matters engendered and evolved under these circumstances are capable in various ways, and with more or less certainty, of producing a precisely similar succession of changes in the blood of another individual, or of any number of individuals: operating always on the same ingredients of the blood as that whence themselves arose, and determining it to the same outlets as that whither themselves were determined; so that the choice of material in the blood, and the choice of outlet in the body, constitute specific characters for the several morbid poisons distinctively, and so that the final products act always as special catalytics for that original material of the blood, wheresoever they may encounter it. But, finally, that under certain possible conditions of accumulation, or tension, in that original material, other circumstances may serve to start it in its progress of specific decomposition, without any demonstrable influence from that external or catalytic, which is the ordinary occasion of its change.

From our foregone analysis of the pathology of morbid poisons, it is not difficult to deduce philosophical principles of treatment, or to devise a rational explanation of such success and such failure as medicine has hitherto encountered in this department of its ministrations. To check the further conversion of material in the blood; to destroy the poison, or to turn it into harmless combinations; to aid or to anticipate the eliminative efforts of the disease; these would be the indications which pathology would suggest, and these have already, in great part, attained the sanction of experience. But both pathology and practice would concur in adding to these principles another, which, in our present age of palliative medicine, admits of almost infinite application; to remember (namely) that in each zymotic disease, nature is proceeding in her own way towards a curative termination, and that where (as too commonly happens) we are incompetent to conquer the disease by direct neutralising antidotes, it behoves us chiefly to devote ourselves to the humbler task of moderating local phenomena, and sustaining constitutional power. Thus it is, that, in a vast number of perilous infections, we are able to assist nature through her difficult process of cure, by no other treatment than the judicious administration of natural dietetic tonics—food and wine. Thus it is, that while we recognise the absolute efficacy of mercury against the poison of primary syphilis, we constantly find ourselves without an antidote against its later combinations, and confidently rely on measures adopted, without reference to the specific nature of the disease, solely on the ground of their general invigorating power. Till you can neutralise the poison of typhus, of erysipelas, of scarlatina within the blood of your patients, as you would neutralise an acid or an alkali in a test-tube, never lose sight of this important principle; never forget that these morbid poisons are eminently depressive to life; that they tend to kill by shock and debilitation.

And finally, see what vaccination has done for one of them, perhaps, formerly the most malignant and unsparing. I have taken pains to explain to you the pathology of its preventive power, and very little reflection on the argument of this lecture will convince you that there is, in the nature of things, no reason why small-pox alone should be frustrated in its tendency—no reason why each zymotic disease should not have its own preventive catalytic—no reason why, in connexion with these other pestilences, other men's names should not hereafter be remembered as gratefully and as gloriously as Jenner's in relation to small-pox. Our resources for this great purpose of preventive medicine are not restricted to the teats of cattle. We have the pharmacopœia before us, many of its articles acting catalytically on the blood, and determining products of decomposition, in a characteristic way, to a specific plurality of organs. Not only is there no reason against the possibility that many of these medicinal catalyses may be preventive of the zymotic catalyses; but there is every reason for such a possibility. To give you an illustration, why should not belladonna (determining the products of its operation to the throat, the kidneys, and the skin) act as a medicinal catalytic of that material which constitutes the susceptibility to scarlatina, and thus, in recognised reality (as heretofore in vague tradition) be preventive of that disease? Again, why should not the direct counteractive influence of drugs be extended in respect of these diseases, when they already are in attack? Why should we not be enabled by one drug to arrest the blood-change of typhus, and by another that of plague or glanders, just as with quinine we render the blood insusceptible of further detriment from the malarious poison.—*Lancet, August* 24, 1850, *p.* 227.

2.—ON HAY FEVER AND ITS TREATMENT BY NUX VOMICA.

By G. T. Gream, Esq.

Hay Fever or Hay Asthma is (in England) a well known complaint, by which many—especially females, and those of irritable surface—are annually distressed during the droughts of summer. Daily, or more frequent, paroxysms of difficult respiration, severe prolonged sneezing, and a burning pain in the nostrils, eyes and face, are the usual symptoms. Dr. Craigie and others doubt the common explanation of the cause of the affection, viz: that it depends upon irritation of the peripheral extremities of the imperfectly protected nerves of the nostrils, &c., by the subtle pollen of the innumerable flowers, especially the grasses, which bloom in May and June, and with which the atmosphere must, in some localities, be greatly charged. In the vicinity of hay fields and wild pasturage, if the weather be dry, those who are susceptible are certain to suffer; whereas, a rainy season, or sojourn on the sea-coast, will enable such persons to escape. Observation of many such facts has fully satisfied us, that there is no good ground for the incredulity expressed in the following passage by Dr. Craigie. "A particular variety," says he, "of catarrh, most prevalent in the summer months during the inflorescence of the hay crop, in certain situations, has been believed to be connected with some irritative vapour exhaled from the flowers of some of the grasses, and has therefore been distinguished by the name of hay fever. It is doubtful whether this idea of the origin of the disorder be well founded; and it seems quite as likely that it is produced, as other varieties of catarrh, by imprudent exposure during excessive heat. The liberties which are often taken during extreme hot weather, are sufficient to induce catarrhal disorders, without having recourse to the assumption of a peculiar emanation." (*Practice of Physic.* vol. i, p. 824: Edin. 1837.) We will venture to say, that no one who had seen such cases of hay fever as abound at this season, and as we have had to deal with during the present and former seasons, and who has carefully investigated into their personal and topographical peculiarities, could have written the paragraph just quoted. The popular theory is correct, that hay fever bears no relation whatever to common catarrh from exposure to cold. We feel assured that the cause and the cure in the two complaints are totally different.—*London Journal of Medicine, July*, 1850, *p.* 699.

[The above remarks were made on reading the following paper by Mr. Gream on this subject:—]

The efficacy of nux vomica as a remedy for hay fever is not generally known.

The symptoms which are removed by its administration are, distressing paroxysms of sneezing prolonged until a state of depression ensues; and preceded by excessive irritation of the Schneiderian membrane, the conjunctivæ, and the face; the latter being heated at the time of the paroxysm, and during the intervals, as if a hot plate of iron was nearly in contact with it.

I believe that the farina of grass has no more influence in causing the disease than that of any other flowers; in hay-fields and hay-lofts there is necessarily more dust than elsewhere—but the dust from beaten carpets, from the roads, and from other sources, produces the same distressing symptoms. I am led to think that in the middle of summer, from the end of May to the end of July, at which time hay fever generally ceases, a quantity of fine dust floats in the atmosphere, finer than any which is in the air at other seasons, increased probably by the farina of the mass of flowers at that period in bloom, but that during later and earlier months, the more frequent rains, and the dews at night, prevent these particles from leaving the ground; and I have been induced to suppose that this reasoning is correct, by finding that, however distressing the symptoms have been during the day, they are all entirely removed upon the occurrence of a shower of rain; the face becomes cool; the irritation of the nostrils and of the eyes ceases, and does not return until the heated atmosphere has again evaporated the fallen rain.

The relief afforded by a residence near the sea appears to be owing to the absence of fine particles of matter near so large a surface of water.

I am indebted to my friend Mr. Hammerton, of St. George's Hospital, for suggesting to me the nux vomica as a remedy in this complaint, which has frequently caused me, personally, much annoyance; it was administered by a friend of his to large numbers of the country people in his neighborhood, who flocked to him annually for relief, having experienced so much benefit from it.

Having taken it for three years with decided effect, and having for nearly that time prescribed it for others, with equal success, I feel bound to publish it.

The preparation recommended, and which I have always prescribed, is the tincture of nux vomica of the "Dublin Pharmacopœia." Ten drops of this should be given for a dose, in water, and increased gradually to twenty drops, three times a day; the action of it should at first be watched. It is an agreeable light bitter; increases the appetite; and influences the Schneiderian membrane, no doubt through the medium of the nerves.

I have accompanied the administration of the tincture with the application of an ointment (as high up in the nostrils as possible) composed of one drachm and a half of Goulard's extract; two ounces of spermaceti cerate, and a few drops of oil of roses or of bergamot.—*Lancet, June* 8, 1850, *p.* 692.

3.—ON CANCER.

By John Simon, Esq., F. R. S.

[In Mr. Simon's admirable Lectures on Pathology, lately published in "The Lancet," we have been particularly interested with the subject of *Cancer*. Speaking of cancerous tumours, Mr. Simon says, that in this term several varieties are included, which, although differing in many particulars, yet in all essential ones agreeing so truly as to establish between them a fundamental similitude, and justifying the pathologist in classing them in the same morbid family. For their differential characters, &c., Mr. Simon refers the reader to Rokitansky's incomparable work, as published by the Sydenham Society, and the admirable monographs of Dr. Welshe and Dr. Bennett. Mr. Simon goes on to say,]

What are the anatomical elements of encephaloid tumours in general? Essentially forms and steps of microscopical cell-growth: round or oval cells, like pus-globules, with dotty contents, and with a nucleus more or less distinct; or cells, like those of glands or ganglia, more opaque with granular material, round or angular, or developed into processes, and having one nucleus or several: or gigantic mother-cells containing within them simple cells of a new formation, or nuclei and granular matter; or cells in various degrees of blackness with pigment, perhaps to an amount which shall render the whole mass *melanotic;* or spindle-shaped bodies with oval nuclei, indicating the commencement of new fibre: or free nuclei—some round and oval, with single nucleoli, having the size of normal gland cytoblasts, others twice or thrice as large, elliptical, with double nucleoli; or elementary granules of all sizes, or glomeruli consisting of them. And, for the intellectual material—it has no high development in such cases: sometimes it will be so amorphous and incoherent, that the microscope cannot identify it; sometimes it will be more fixed, but scarcely more shaped, having the faintest appearance of fibre, and carrying a few elongated nuclei in its substance: sometimes in this form it will be more distinctly membranous, opaque, and fibrillated: sometimes spindle-shaped bodies with nuclei will be arranged as septa; sometimes there will be a developed fibrous frame-work, forming distinct alveoli for the cellular elements of the tumour: sometimes, though very rarely, there will be a bony stroma for the growth, supporting it, not at its base in the form of an osteophyte (as when in contact with normal bone) but actually spread throughout the tumour, as a fine diploe, within which the cancerous germs lie as marrow.

To complete this statement, I should add that the products of hæmorrhage in greater or smaller quantities will often be found in those tumours, constituting the variety of *fungus hæmatodes;* that large granuliferous cells, with more or less abundance of free oil, will be seen in them, often gathered in clusters, which to the naked eye seem yellow; often diffused in lines which run together in plexuses, and constitute an appearance, which Müller believed to be characteristic of one species of cancer (hence named *reticulatum*) but which belongs to all at one period of their development: and finally cysts will sometimes be noticed in combination with these encephaloid elements, and may or may not have their cavities partially occupied by the further growth of such elements in their interior: the latter possibility being chiefly illustrated in the breast, brain, and testicle.

The chemical constitution of encephaloid cancer is almost as brainlike as its appearance: albumen and fat are its main ingredients: the former in overwhelming proportion, the latter in varying quantity (sometimes very considerable) and in quality closely resembling the cerebral fats of the human subject.

The materials which during life runs from the ulcerated surfaces of such a tumour are identical with those which post-mortem examination displays in its interior structure: and hence it is that in every instance of fungating sore, the microscope can inform us whether the discharge be the product of cancer, or of simple suppuration.

I have now described to you the ordinary characters of encephaloid cancer, sufficiently to furnish a text for such pathological remarks as I have to make on it: and sufficiently also to serve us a standard of comparison for the other two so-called species of cancer, *scirrhus* and *colloid*. I have sought to give chief prominence to the encephaloid form of the disease, because I believe it to be cancer *κατ' ἐξοχήν*: because I believe it to be the highest and completest expression of that morbid tendency which constitutes the cancerous diathesis; because, in a word, I believe it to be of all cancers the most cancerous.

The distinction of the other species are these:—*Scirrhus* derives the sensible qualities which give its name from the greater fibrousness of structure: there is spread through its substance a continuous uniform net work of filamentous tissue, or a radiation of fibres from several separate dense centres, or a coursing of ligamentous bands, which branch and anastomose: and in the interstices of this rigid plexus, there lie microscopical elements, identical with those of encephaloid; identical (that is to say) with many of the cell-forms which I have enumerated, though not often presenting that excessive development which leads to endogenous cell-growth, or to the formation of large caudate cells; but showing, in preference, an abundance of those shapes which are transitional to filamentous tissue—spindle-shaped bodies, and nucleated fibres, in various stages of their growth. The scirrhous mass compounded of these elements is often very hard and tough, feeling like cartilage, and cutting like ligament; its section shows a bluish-white color, and seems glossy and semitransparent where the mass is firmest; but in points where softening is in progress, the surface appears more opaque and buff, presenting that yellow *reticulum*, or other yellow accumulation which I have already spoken of, as depending on an oily transformation of its material into the substance of compound granuliferous cells. I may add, that scirrhus is far less vascular than encephaloid cancer; that it grows less rapidly, and remains within much narrower limits of size; and that it is rarely the seat of interstitial hæmorrhage.

Colloid deviates from the standard of encephaloid, usually, in a different direction to scirrhus. It is even less vascular than this disease; but unlike it, it is often soft, gelatinous, or gummy: and yet this does not depend on the absence of fibrous tissue, for some forms of the disease have an equally distinct filamentous frame-work; the softness of such specimens depending evidently on the peculiar nature and copiousness of that material which lies within their fibrous plexus, and which constitutes the bulk of the morbid mass. This characteristic material is a colourless, transparent jelly; in substance something like the crystalline lens; often as soft as the outer layers of that body, sometimes harder than its inmost layers; where scattered on membranes in the form of small rounded masses, it suggests to the mind the thought of a drop of quite colourless gum, fallen on the surface and dried there in its globular shape. A thin section of this extraordinary product shows in most instances that the gelatinous ingredient lies within very distinct loculi; often so distinct, that from this circumstance the disease has been named *alveolar cancer*.

I should hesitate to say that, as a rule, the fibrous tissue is more developed in colloid than encephaloid cancer; for, on the one hand, its greater perceptibility may be due, in a chief degree, to the extreme translucency of the intervening jelly, which sets these fibres off as though they were dried in Canada balsam; and, on the other hand, it is frequent to find specimens of colloid, in which (as in many of encephaloid) no fibrous net-work is perceptible, but in which the only trace or rudiment of matrax will consist in the faintest, almost imperceptible hyaline material, disposed reticularly, with some few elongated nuclei in the axis of its distribution. The intralocular material appears to be more peculiar in its physico-chemical qualities, than in respect of the organic shapes which occur in it. Sometimes a quantity of jelly will seem amorphous under the microscope; sometimes ordinary round or oval uninucleated cancer-cells, with fluid transparent contents, will be found; sometimes (though I doubt if this be not a partial admixture of alveolated encephaloid) a loculus will be full of simple cells, tending to become opaque with granular proteinous contents; sometimes a large granular mass, itself opaque, will lie amidst clear blastema, within a loculus, will be bounded by no distinct membrane, will not be resoluble into separate cells, but will contain a number of nuclei diffused in its substance; sometimes (though less often than is supposed) it will contain true mother-cells, having smaller cell-brood within them; sometimes it will present chiefly naked nuclei and nucleated fibres traversing its jelly at long intervals of distance, and associated probably with an abundance of oily globules; the latter elements may exist separately, or may be clustered in compound cells, or may be ranged in long branching lines which seem to follow the incipient fibrous organization of an interlocular matrix. All these ingredients are substantially the same as those of the other forms of cancer, differing only (so far as the eye can judge) as to the translucency and gelatinousness of the blastema in which they grow, and perhaps also as to the arrangement of their fibrous skeleton. With those other forms of cancer, moreover, colloid is ready to combine itself, and especially with encephaloid; which not only may unite with it in the construction of one tumor, but may arise as its secondary consequence, when colloid, as a primary disease, has contaminated the lymph or the blood.

With respect to the *habitat* of cancer (taking it again generically) the following, according to Rokitansky's large experience, is the order of choice in which the several organs of the body are primarily attacked by it—viz., most frequently the uterus, the female breast, the stomach, the rectum; next, the lymph glands, the liver, the peritoneum, the bones; next, the skin, the brain, the globe of the eye, the testicle, the ovary, the kidney, the tongue, the œsophagus, the salivary glands. As regards the species: colloid prefers the stomach, the rectum, the peritoneum; scirrhus, eminently the female breast; next, the intestinal canal and especially the stomach; encephaloid may occur in all organs, but there are some in which no other form of cancer ever exists—the liver, the kidney, the lungs, the testicle, the globe of the eye, the lymph glands; and it constitutes the only form in which a secondary development of the disease is known to occur.

Cancer may exist simultaneously in several organs of the body; but, where this is the case, we are generally able to distinguish, that in one organ its appearance has been *primary*, and that the other organs have suffered in *secondary* or *tertiary* succession. Its first outbreak is commonly in a single organ; and this first focus of the disease has a faculty, which in some respects is peculiar to cancer, of diffusing its contamination through other parts of the system. There are three manners in which this contamination may arise:

["First," says Mr. Simon, "it seems probable that if the germs of cancer alight and are retained even on simple continuous surfaces, they can fructify and lead to the development of a tumor, the disease here *transferring itself by immediate contact*." Secondly—"If by some lesion of the veins they are allowed to enter the circulation, they will become centres of cancerous growth in the substance of whatsoever organ the blood may carry them to and fix them in." Thirdly—"That method of propagation which is effected by the lymphatic canals, and which consists essentially in transference, *by continuity of blastema*."

Proceeding now to the pathological affinities and contrasts of cancer, Mr. Simon continues:—]

Thrust aside all the accidents and trivialities of the subject, strip the question naked, and what does a cancer mean? Substantially it is a new excretory organ. Under the pressure of some mysterious constitutional necessity, a growth arises, which (in its typical form) tends essentially to acts of eliminative secretion; just as distinctly as the healthy liver or the healthy kidney. You must not stop short at the *tumor:* you must scan the whole drama of the disease, in which the tumor forms but a pro-œmium. Look again at such a case as I gave you for illustration—a case of encephaloid manifested in the globe of the eye: that fast fungating ulcer which ensues on the protrusion of the tumor, and which continues hourly to purge forth its profuse discharge—that is the real intention and purpose of the tumor, as palpably as urine expresses the intention of the kidney, or bile the intention of the liver. The cells of the tumor have grown like healthy gland-cells—like the nucleated cells of a mucous membrane, only to discharge themselves with their contents. There is nothing, I repeat, like hypertrophy in the disease: it consists essentially in the establishment of a new vent—a new organ of elimination; and that organ developes itself according to the type of other secreting organs; it developes itself as an apparatus for the formation of deciduous cells.

How constitutional—how intensely constitutional—is this eliminative action, can hardly be misunderstood. The mere fact that nature thus (if I may say so) deliberately, and without any exterior provocation, organizes in one spot of the body a drain which becomes so ample as to starve the remainder; the circumstance that this flux is not a single emptying out of some previous local accumulation (such as one sees in the pointing and discharge of an abscess) but is a persistent process, depending day by day on new acts of growth; the observation that the tendency to the disease is in many instances hereditary; the existence of a marked cachectical state which precedes, as well as accompanies, the evolution of the tumor; and, most of all, that flagrant evidence of metastasis which daily renews itself for our instruction, consisting in the failure of surgical operations, by reason of the obstinate emergence of the disease, even again and again, in parts previously uncontaminated by its presence:—these arguments are to my mind as conclusive for the constitutional and purely constitutional origin of cancer, as any which I could adduce to show you the constitutionality of small-pox or gout.

I infer that the formation of a cancer in the body is not so easy and off-hand a process as the local determination of gout or rheumatism; I infer, either that a special cell-growth is necessary, which it takes time, with some intensity of cachexia, to construct; or at least that the existence of such a cell-growth promotes, in a remarkable degree, the ulterior development of cancerous phenomena; and, in either case, that the system will tolerate a not inconsiderable degree of whatsoever conditions form the cancerous diathesis, without proceeding to construct a cancerous tumour *de novo*, when every atom of its primary structural manifestation has been thoroughly removed from the system. Even in gout, where the facility of local organization is comparatively great, we know how long a time may elapse, and how much general illness may arise from gouty blood, before the disease first succeeds in centralizing its products at the toe, or elsewhere; and if that toe were removed, there would probably be another lengthened period of latency, before a new focus of gouty inflammation could be established. And this difficulty exists, as I have said, to a much greater degree in regard of cancer, owing to its requirement of a special structure for its eliminative acts; whence we may confidently argue, that cancerous diseases have a chronic period of latency, during which their cachexia acquires intensity from accumulation, till at length it suffices to establish the local vent; and we may argue further, that the disease can be again reduced to this state of latency, and to the accompanying difficulties of evolution, if all such local conditions be removed as favored the first lcoalization of its products. And here lies the practical importance of these considerations; for it is exactly in that chronicity which we have traced in the constitutional disease, and in the reluctance with which Nature proceeds to a total reconstruction of the cancer-growth, that the chance, (such as it is)of doing good by surgical operation, singly and entirely consists. And the whole tact and discrimination of the surgeon, in deciding whether an operation may probably lead to cure of the disease, have to be brought to bear —first, on determining the total abstinence of any secondary deposits, or any irremovable extension of the growth, which might serve as a centre of new development; and secondly, on measuring the intensity of the constitutional cachexia.

In respect of the latter point, there are many obvious considerations, as to the rapidity with which the tumour has been evolved, as to the state of activity in which it actually is, as to the patient's apparent general health, and the like. But I pass over these topics (as better adapted for clinical illustrations) in order to suggest to you the sort of guidance which you may derive from the site of the disease, from its species, and from the amount of local influences apparently concerned in its production.

As respects the pathological relations of the forms or species of cancer, each to the other, it seems to me that the cancer is a perfect expression of the cachexia, in which it arises, in proportion as it contains the means of fulfilling its eliminative destiny. Encephaloid, consisting entirely of cell-growth, and hastening to discharge itself, seems the most characteristic representative of what is fatal in cancer—a view additionally confirmed by its rapidity of evolution, and by the empirical evidence of its habitual return after operation. Of colloid I can scarcely offer an opinion; it is too rare, especially in surgical practice. Scirrhus I apprehend to be the lower manifestation of the disease; and in proportion as the scirrhus character predominates in a tumour—in proportion as the blastema has suffered itself to undergo a fibrous transformation —in such measure I cease to recognise that which is distinctively cancerous and malignant. In this respect I would compare encephaloid and scirrhus, in their mutual relations, to the fibre-forming and cell-forming sequels of inflammation; the intenser inflammatory acts running into the pure cell-forming process of suppuration; while the less intense inflammatory acts deviate into the slower construction of fibre.

I will not venture to deny that local conditions may check the development of cells, and may thus interfere with that free eliminative process, by which the cancerous cachexia seeks to relieve itself; and the disproportionate excess of nucleated fibrous material may sometimes possibly indicate some such local influence, thwarting the general tendency of the disease, and preventing the local structure from being an adequate expression of the constitutional fault. But—were it not for this possibility, I would venture to say universally (and even with this qualification, I would generally say) that the nucleated fibrous material will be abundant in proportion as the malignant cachexia has exhausted itself; that fibrous transformation, so far as it extends, illustrates the operation of common, not of specific, developmental influences in the part. So with regard to those compound granular corpuscles, constituting the yellow softening material in cancerous growth, there seems no difficulty in adopting the view (lately urged by Virchow) that these bodies represent the degeneration of cells, and consequently *cæteris paribus*, evince a retrogressive tendency in the effusion where they occur. If we may consider these two points established—that fibre, *quoad* its existence and quantity, illustrates an abortion of the cancer growth—that compound granular cells, *quoad* their existence and quantity, illustrate an exhaustion and retrogression of the morbid influence, we possess some material in pathology (though not always applicable in practice) for guiding our prognosis as to the probable recurrence of the disease. The lesser malignity of scirrhus, however, loses much of its relative advantages in fact, from the circumstance of its ready diffusion, by continuity of blastema, to the adjoining lymph-glands; and, as I have already told you, the presence of a single batch of cancer-cells in a lymphatic gland is quite sufficient to insure for the cachexia every needful opportunity of development—quite sufficient to forbid the hope of any prolonged period of latency.

Next, as regards the inferences which may be drawn from the evidence of local causation in the origin of cancer—there is a belief that blows often cause it, that it follows inflammation or functional excitement, that it invades erectile tumours, and the like. In regard of this belief, it appears to me that its preference for particular organs, or for organs in a particular state of action, admits, in some respects, of being generalised in a ready explanation. The part most readily selected for the invasion of cancer, the *pars minoris resistantiæ*, will probably, in many instances, be one previously the seat of hyperæmia. The uterus and the breast, with their frequent fluctuations of nourishment; the lip, or the tongue, or the stomach, which for years has been kept in a state of irritation and over-vascularity by local circumstances; the part which has suffered effusion from a blow; the vascular tumour, with its superfluous blood;—such are the organs in which cancer most readily makes its first appearance. And for this obvious reason, the disease has to develope itself out of blastema, furnished by the blood for the materials of its nourishment; it has to compete with the assimilative acts of the several healthy organs of the body; and it chooses, in preference, any structure where, by previous contingencies, the necessary materials for its growth may accidentally be present in excess.

As respects local influence, we may perhaps be justified in stating thus much:—that circumstances of tropical irritation and hyperæmia will enable cancer to localise itself under a less intensity of cancerous cachexia than would else be necessary for the origination of the process; that, except for such local facility being afforded to it, the cachexia might have remained latent, or at least might never have realised its critical and evacuative tendency; that, for instance, a chimney-sweep, except for the local irritation of soot, would not have had cancer developed in its scrotum, and might not have it developed at all. And in these cases, where we can distinctly recognise the influence of exterior irritation in promoting the evolution of the disease, and where (as occasionally happens) we can believe that the cachexia would have been insufficient for that effect, except for the adventitious aid thus given to its feebler intensity; in these cases and on these principles it is, that surgical interference is often eminently useful, by depriving the cachexia of the local advantages it had gained. It is peculiarly in respect of cutaneous cancer, and cancer of the tongue, that this line of argument applies; and I may mention to you, that, in these instances of the disease, there is a still further illustration of the low intensity of the cachexia, seeing that the formation of new structure is always here at its minimum: that the development of true cancer-growth is always peculiarly slight; and that here (if anywhere) it is, that the previously existing elements of the tegumentary surface are used for the eliminative action of the disease. For what is called epithelial cancer is, in regard of its function, as true a cancer as any: cancer of the lip or of the tongue is as unquestionably an evidence of the cachexia, though not in so high a degree as fungoid testicle would be: and yet, in its examination, we often are unable to discover any elements but such as we might ascribe to epithelial hypertrophy.—*Lancet, July* 27, 1850, *p*. 103.

4.—PRACTICAL INSTRUCTIONS ON THE REMEDIAL EFFICACY OF A VERY LOW OR ANÆSTHETIC TEMPERATURE IN CANCER.

By Dr. James Arnott, Physician to the Brighton Dispensary.

[From the report of a case of cancer, treated by an anæsthetic temperature or congelation, Dr. Arnott shews "that it furnishes us with a perfect means of relieving the pain of that dreadful disease, without producing the stupefaction and disturbance of the system that attends the use of narcotics, and that instead of precipitating the unfortunate patient's fate, congelation, by arresting the accompanying inflammation, and perhaps destroying the vitality of the 'cancer cell,' is not only calculated to prolong life for a great period, but may not improbably in the early stages of the disease exert a curative action." Dr. Arnott proceeds:]—

As the subject will probably be entirely new to many readers of this paper, it may be proper to give a brief account of the agent whose effects in cancer it is its purpose to describe. The very low or anæsthetic temperature that is used remedially as a local application to inflamed or painful parts, is produced by what are termed frigorific mixtures, or combinations of pounded ice and various salts, which, in dissolving reduce the temperature below the degree of zero of Fahrenheit's thermometer, or more than 30 degrees lower than any temperature hitherto employed in medicine. The application of such a mixture to the skin, or mucous membrane, causes little sensation of any kind, as the part soon becomes benumbed, and the slight tingling or smarting produced (which is seldom so great as to be complained of by the patient) is more allied to the sensation of heat than of cold.

In the first place, congelation will cure diseases and relieve pains that cannot be cured or relieved by any other known means; and where the same effect may be produced by other means, it is not produced so rapidly. Both as an antiphlogistic and as an anodyne, congelation is much more powerful as respects many diseases than any agent or combination of agents, possessing similar qualities hitherto employed in their treatment, and which on that account have often proved ineffectual. A very low temperature will arrest every inflammation which is near enough to the surface to be accessible to its influence, and totally and permanently remove irritation from the nerves which it can reach.

In the second place, congelation is a safer remedy than most of those which are usually employed for the same purpose. Bleeding often impairs or prostrates the reparative powers; both antimony and mercury occasionally act as poisons; opium stupifies and excites; and events have shown that, as anæsthetics in surgical operaions, ether and chloroform are not altogether without danger. Not once, in upwards of two thousand applications which have now been made of it, has congelation caused the least injury.

Other advantages of congelation might be mentioned, but these of its greater certainty, promptitude, and safety, must suffice. Cases are every day happening, where life is endangered or lost by inflammation that cannot be subdued by bleeding or the ordinary measures, without incurring greater hazard from the debility which they occasion, or other injurious effects; and cases of suffering, to which, from some constitutional peculiarity, the ordinary anodynes are inapplicable.

That a great desideratum existed here, was strongly evinced by the recent deplorable case of a much lamented statesman, who died from injuries causing inflammation and intense pain. The medical art has never appeared to greater disadvantage than on that melancholy occasion. The inefficient measures resorted to, only showed the indications which the medical attendants were anxious to fulfil, but which, it would seem, they were unwilling to attempt fulfilling by the means in common use. What appeared to be wanting were, an antiphlogistic remedy that would not debilitate, and an anodyne that would not excite.

The patient M. R., was admitted at the Brighton Dipensary on the 25th July, 1849. Of short stature, thin, sallow complexion, and about 42 years of age. Her principal symptoms were frequent, and severe paroxysms of pain, chiefly in the back and hips; a profuse and most offensive discharge and occasional hemorrhage from the vagina, and derangement of the digestive organs. On examination, the neck of the womb was found hard and ulcerated.

For six months the usual palliative treatment was pursued—viz., the exhibition of the preparations of opium and the application of leeches. She complained that the opium made her constantly drowsy and unfit for her occupation as a needlewoman; and the pain was notwithstanding its use, occasionally so severe as to oblige her to rise from bed and roll on the floor of her room.

In January, I determined upon a trial of congelation, having previously made another careful examination of the uterus. The disease had by this time considerably extended: the neck of the womb was now completely destroyed, and there were several warty excrescences in the upper part of the vagina. Congelation was effected by means of a frigorific mixture of two parts of finely-pounded ice and one part of chloride of sodium, introduced through a wide speculum, of gutta percha, having the lower part of its upper opening of a cup-like form; and in order that the temperature might be maintained at the requisite low degree, or below zero of Fahrenheit, the dissolved ice was continuously drawn off by a syphon of peculiar construction. This peculiarity consists in a large two-necked bottle being connected with or constituting part of the long arm of the syphon; and the purpose of it is, that a stream of water may continue to flow along this part of the syphon, and keep up the suction at its proper extremity, notwithstanding any interruption in the supply. A tube of vulcanized india-rubber forms the remaining part of the syphon, with a small glass tube where it enters the speculum, in order that the rising column of liquid may be seen and regulated by a stop-cock.

The success of this application exceeded my expectation. So soon as I had learned to apply the frigorific properly, I was able to give immediate and entire relief, and this has generally continued complete for about a week. The discharge was soon diminished, and became much less offensive, and the tendency to hemorrhage ceased. From twenty to thirty applications of the frigorific have now been made, and scarcely any other remedy has been used. No advance of the disease appears, on examination, to have taken place, and in other respects there is decided improvement. The patient is not so thin; her appetite is tolerably good; she is stronger, and able to occupy herself in the usual household affairs.

She is directed to call whenever the pain returns. The speculum is generally introduced by herself while in the supine position, and she covers her extremities with a sheet before I enter the apartment. The nates are raised, in order that the speculum may be sufficiently upright to contain enough of the frigorific, which has usually been kept applied for a period varying from a quarter to half an hour. There is a slight sensation of smarting produced for a minute or two, and the pain from the disease has generally ceased within the first five minutes. If the womb be now inspected by removing the frigorific from the speculum, the greater part of its visible surface will be found perfectly white and hard. The application is terminated by allowing about a quart of cold water to run rapidly through the speculum and syphon for the purpose of gradually restoring the natural temperature, and washing away any remaining salt.—*Lancet*, *Aug*. 31, 1850, *p*. 257.

The benefit derived from congelation, in the case of uterine cancer just related, is not only very superior, but almost forms a contrast, to that usually obtained by other palliative means. Besides that the relief from pain is more complete and lasting than that obtained by the preparations of opium, it is gained without the stupefaction and sickness that generally attend the use of these; and instead of shortening life, by the disturbance of its functions, as these and other palliatives most unquestionably do, congelation will much prolong it, and prolong it in comfort, by arresting the course of the disease. Whether more is to be expected from it—whether, in the earliest stages especially, it may not possess energies equal to the complete removal of the disease—is a point that must be decided by further experience.

It has been a question, whether certain diseases, such as pulmonary consumption and cancer, which have been found to resist all the methods of treatment hitherto employed, are not necessarily fatal or incurable by the powers of nature or by art. As respects the remedial powers of nature, this question may, unless certain observers have been much deceived, be answered in the negative. Of cancer, at least, many natural cures have been recorded; and it is, moreover, in opposition to analogy, to suppose that any morbid condition of the body is necessarily incurable.

Another question, on which the opinions of inquirers have been much divided, and which bears closely on the efficacy of the local remedies of cancer, is that respecting the seat of the disease—whether this exists in the constitution as well as in the part manifestly affected. Late microscopical investigation, by Müller and others has thrown considerable light upon this point, by showing that cancerous growths consist, in great part, of a congeries of peculiar cells. As these morbid cells, possessing inherent vitality, may be regarded as a species of parasitic animalcule or hydatid, the oldest hypothetical notion of the nature of cancer, curiously enough, to have received a foundation in the latest anatomical researches.

[The remedies that have been employed in cancer are empirical or rational. In this disease, however, empirical remedies are of no value. The rational practices may be divided as follow:—1. Means of subduing inflammation. 2. Narcotics. 3. Medicines which have been employed as alteratives. 4. Extirpation or ablation. 5. Pressure. And lastly, cold. It is upon the value and efficacy of this last remedy that Dr. Arnott particularly enlarges. He says,]

Cold has already been adverted to as a remedy for cancer in the consideration of the means best fitted to subdue inflammation; but it is calculated to fulfil other purposes. It is well known that a certain temperature is necessary for the maintenance or vigor of both animal and vegetable life.

"In a cancerous growth (says Prof. Bennett, in his recent and excellent work) the tendency of which is to excessive cell-formation, we evidently retard its advancement by the application of cold. Were it possible, indeed to bring down the temperature of an entire growth below the vegetating point, we must inevitably kill it; but supplied as it is through the warm blood within, this is impossible. Still the external application of cold is one of the most powerful means we possess of retarding the progress of a cancerous or any other growth."

As a means of applying cold in cases of external cancer, the same writer adverts, in favorable terms, to the apparatus alluded to in a note to the preceding paper, by which a low temperature can be uniformly and long maintained, and at the same time be conjoined with pressure. In the appendix to my Essay "On the Present State of Therapeutical Enquiry," I included this amongst other probably useful applications of the "current apparatus," and I have since had an opportunity of ascertaining its value in practice. The instrument is much more easily managed than at first might be supposed. The vulcanized caoutchouc tubes through which the current passes to and from the pressing water-proof bag, may be easily detached from the reservoir and waste vessel by the patient herself, if she wishes to rise from the sofa; and the current can be as easily re-established.

Having now passed in brief review the several rational measures which have been used or suggested in the treatment of cancer, we shall be better able to form a correct opinion of the mode in which congelation operates so beneficially as a palliative, and of the probability of its proving an effectual cure of this disease. As a palliative, it fulfils most completely the purposes of the first two classes of remedies just enumerated—viz., those possessing antiphlogistic and anodyne properties, and, unlike these remedies, it fulfils them without any counterbalancing injurious properties.

If cancer were essentially an inflammation, according to the doctrine of Brousais, there would be little doubt that congelation would, in many of its localities, prove a cure, for no inflamed part which can be put thoroughly under its influence will resist it. Or if the opinion of Prof. Bennett be correct, that a "temperature below the vegetating point must inevitably kill cancer-cell," and if it be true that cancer-cell constitutes the disease, we might reasonably indulge the same hope. At all events, as congelation surpasses in power every local therapeutical agent which does not actually destroy the animal texture, we may safely, from this, together with other considerations, conclude that no remedial means hitherto proposed is, under any management, so likely to afford an effectual cure.

In estimating the effect of the application of frigorific mixtures to the animal tissue, it is highly necessary to take into account the condition of the part subjected to them, in respect to its own vascularity, and the vascularity of the neighboring parts, and as to whether it be in a state of inflammation or not. A highly vascular or inflamed part necessarily requires, in order that the same effect should be produced, a much more powerful congealing agent than a part in the reverse condition. Although five minutes is the usual period of the congelation which I apply to the exterior of the body, when the skin and subjacent tissues are in their normal state, it was, as has been related, continued from fifteen to thirty minutes in the case of uterine cancer, and probably not with half the effect as when it is applied to the exterior, on account of the higher vascularity and natural heat of the part subjected to it. The difference between the periods mentioned was owing to the more or less perfect application, the time required to relieve the pain, and sometimes to the appearance of the congealed part.

Various modes of applying frigorifics to cancer must be employed for its various localities. That which has been described is perhaps the most complicated.* When the cancer is on the exterior of the body, the frigorific can be easily applied by the small net which I have already described in speaking of the use of congelation in neuralgia and diseases of the skin. As an illustration, I will very minutely describe its application to the case of cancerous breast, in the Middlesex hospital.

It was made on the 22nd of June last. The patient (an elderly woman, of the name of Pocock) had long suffered from severe and almost continuous pain. Her breast was ulcerated, but not much enlarged. About half a pound of ice having been put into a towel, and broken up into powder on the floor of the ward, by means of a flat iron, was quickly mixed in a jug with about half the quantity of common salt. The mixture was then poured into a small net of the thinnest silk gauze, and immediately applied to the breast over a circular space of about four inches in diameter. The brine, as it trickled from the net, was absorbed by a moist sponge held underneath; and the net was occasionally raised, for the double purpose of inspecting the breast (as the surgeon who had kindly permitted the operation, and his assistants, were naturally anxious to watch the effect) and of stirring the mixture. The skin became white in a few seconds, and the congelation was continued for precisely three minutes. There was a slight pricking sensation produced for about half this period, which ceased upon the part becoming benumbed; and a similar sensation was experienced for some minutes after the congelation had ceased, although the greater part of what is usually felt at this time was prevented, by keeping the part covered for about five minutes with the ice net, (after washing out the salt), and by the subsequent application of a rag dipped in cold water.

I did not see the patient again until the 6th of July,—fourteen days after the application,—when she told me that there had not been the least return of pain. The sore on the breast was clean, and even healthy in appearance; and nothing but the common water-dressing had been applied. There had been no necessity for a repetition of the morphia, to which she had been so long accustomed.

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* Cancer is not the only disease of the womb to which congelation may be thus applied with advantage; and by means of a frigorific mixture contained in a thin tin tube, of the diameter of the common speculum, and having its end closed and rounded, congelation can be conveniently used in inflammatory affections of the vagina.

In cases of this description, it would probably be wrong to wait for a return of pain as a sign for the re-application of the frigorific. The disease may advance without the accompaniment of pain; for it is well known that some cases of cancer are attended with little or no suffering. The congelation is demanded to stay the irritation, and the progress of the malady, as much as for the alleviation of pain.

In order that the frigorfiic mixture may be perfectly applied, it is necessary that the diseased surface should be in a horizontal position; and where it is denuded by ulceration, a thin membrane spread over it might act as an artificial cuticle, and prevent the smarting which the contact of the salt would otherwise produce before the production of anæsthesia.

Congelation need not be confided in exclusively. Several of the measures enumerated above may be used in combination; and equable and easily controllable pressure, whether by itself, or conjoined with cold, is, as respects many localities, one of the principal of these.

It is an important fact, that cancer in the womb, in which pressure can hardly be employed, should, in cases to which the operation is applicable, have (probably from the isolated nature of the prolapsed organ) been more successfully treated by amputation than cancer occurring in any other locality. The misfortune is, that the cases are rare in which this operation can be resorted to. If the womb be forcibly dragged out before the incision is made, or extirpated while in its ordidary situation, death (as ample experience has shown) is almost the inevitable and immediate consequence. Yet, when we consider that a womb which has become prolapsed from natural causes may be removed with very little danger, (a fact attested by numerous examples,) it becomes an interesting question, whether, in the early stages, and before the disease has extended to the adjoining parts, it might not, supposing all other means should fail in arresting the malady, be very gradually, and without irritation, brought into the same favorable position. If natural prolapsus of the womb mainly proceed, as is commonly supposed, from relaxation of the vagina and the external parts, this relaxation could be easily effected by the use of such a fluid dilator of equal pressure, as I have, on another occasion, suggested (and which I have myself employed) as a substitute for the forceps, or for excitants of uterine contraction, in cases where the birth of the child has been opposed by the most common of all causes of protracted labor—the unyielding of the external parts.—*Lancet*, *Sept*. 14, 1850, *p*. 316.

5.—TREATMENT OF STRUMOUS DISORDERS BY MEANS OF PREPARATION OF LEAVES OF WALNUT.

By Dr. Negrier, Physician at Angers.

[Dr. Negrier has published two memoirs, the first in 1841, and the second in 1844 on this subject. These consisted entirely of practical facts, without any theoretical view either of the disease or remedy, and the experience of five years, and that of several foreign physicians, have given corroboration to the facts which the author then advanced. In this, the third memoir, he is desirous to avoid everything beyond a simple statement of facts, and the inferences which directly may be deduced from them. The following general conclusions are deduced by M. Negrier:]

Fifty-six patients, affected with scrofulous disease, in different forms, were treated by means of preparations of the walnut-tree leaves.

In this number, thirty-one were cures, and did not afterwards disappoint expectation. Eighteen patients, without being completely cured, underwent a degree of amendment very remarkable in their condition; and the greatest number among them were in the course of being cured. Four patients have obtained no advantage from the use of the medicine, from the state of their sores. Among them was one who was remarkably strengthened, and who, at the time specified, seemed in the course of being cured, under the use of cod liver oil.

Four children died during treatment; but two were destroyed by tubercular phthisis, one by acute *encephalitis*, and the fourth by double pneumonia.

The treatment, by the preparations of walnut-tree leaves, has furnished to him results, which he regards as sufficiently advantageous, in order to justify their serious examination, and warrant their being subjected to the control of systematic observation, particularly by hospital physicians, who have better means than others of administering the remedy accurately and in comparison with other agents.

Experience has satisfied him that the long-continued use of walnut-tree leaves has never caused, in the economy, any unpleasant effects. This medicine, which may be placed in the class of slightly-aromatic bitters, possesses an efficacy nearly uniform in scrofulous disorders.

The first effect of the preparations of walnut-tree leaves is to augment the activity of digestion and circulation; to all the functions they impart a remarkable degree of energy. A natural question is, whether they exert any special action upon the lymphatic system? The facts recorded by the author lead him to think that they do. Under the influence of their use, the muscles become more firm, the skin acquires a ruddy tint, and speedily parts with its chlorotic paleness. It may be a subject of inquiry whether the walnut-tree leaf contains any other principle than tannin, which is, doubtless, not foreign to the tonic action of this vegetable.

As to comparison between this and other received methods of treatment, the condition in which most of the patients whose cases formed subjects of clinical observation were found, at the time of treatment, sufficiently prove, he maintains, that these different modes of management possessed no efficacy, when recourse was had to the preparation of walnut-tree leaves.

The preparations employed are the following:

The infusions of the walnut-tree leaves are made by placing a good amount (pinch) of these leaves, cut, into two hundred and fifty grammes of boiling water. This infusion is sweetened with sugar, or with the syrup to be presently noticed. M. Negrier prescribed from two to three cupfuls of this infusion daily; and as many as five may be given.

The decoction of the leaves, which acts advantageously in the form of lotions, and as a topical application, in which the pledgets for dressing the sores are immersed, ought to be more strongly charged than the infusion. M. Negrier uses a small handful of leaves to a kilogramme of water, and boiling is continued from ten to fifteen minutes. This preparation is also very useful in the form of baths both local and general. Its efficacy is particularly remarkable when used by injection into fistulous passages. The extract is prepared with the walnut-tree leaves, by the method of displacement. By employing the dry leaves, the practitioner has in his power the means of renewing this preparation, as often as he requires, during all seasons; while, by using recent leaves, it is requisite to prepare it in too large quantity, and it is liable to undergo alteration. The syrup of the leaves of walnut-tree is prepared with the extract by mingling forty centigrammes with thirty grammes of simple syrup. By this means the practitioner knows what are the doses of the medicine which he employs. The syrup may also be prepared with the green leaves; and it is then more aromatic than that which is compounded with the extract; but it is impossible in this case to form a correct estimate of the quantity of the medicine which the patient daily takes. To young children he gives two or three teaspoonfuls of syrup in the course of twenty-four hours. The ordinary dose for adults is from thirty-two to forty grammes; and he has never gone beyond sixty-four grammes.

The pills of the extract of walnut-tree leaves are each twenty centigrammes of extract, rendered consistent by a sufficient amount of the powder of the leaves. Of these, two are taken daily; and he has never gone beyond four daily.

Lastly, in some cases, in which it may be useful to cause friction to be made upon the afflicted region, he employed an ointment composed of thirty grammes of extract of the leaves, forty grammes of lard, and fifteen centigrammes of essential oil of bergamot. The frictions require to be made gently, and for about fifteen minutes twice daily.

It is easy to understand, he observes in conclusion, that, considering the nature of the disease, the salutary effects of treatment are sometimes slow in appearing. He therefore recommends perseverance; and he expresses the opinion that, if in the hands of some practitioners the preparations of walnut-tree leaves have been administered without efficacy, the reason is, that either the patient or the physician became too soon tired with using them. It is, in short, requisite to persevere, when it is remembered, that, in order to obtain a durable cure, the physician has not only to oppose the effects of the malady, but also to effect a thorough change in the constitution of the individual.

[Having published his second memoir in 1844, M. Negrier completed the history of those patients given in the first paper, adding a list of persons treated by the remedy subsequent to the publication of the first memoir, and he gives the following inferences on the result of the observations of six years experience upon the mode of treatment:]—

1. Scrofulous disorders are in general radically cured by the use of preparations of walnut-tree leaves. 2. The action of this therapeutic agent possesses a sufficient degree of steadiness to enable the practitioner to reckon upon the cure of three-fourths of the patients treated by means of it. 3. The action of this mode of treatment is generally slow. It requires from twenty to fifty days, according to the nature of the symptoms, and the constitution of the subjects, in order that the effects be rendered sensible. 4. Patients cured by means of the preparations of walnut-tree leaves almost all retain the health which they have obtained under the influence of this treatment. Few relapses take place. 5. The effects produced by the internal use of the extract of walnut-tree leaves are at first general: the influence of this method of treatment is subsequently evinced upon the local symptoms. 6. In certain forms of scrofulous disorders, it is only after a long time that the efficacious action of this treatment is observed. This remark is particularly applicable to strumous glands not in a state of ulceration. 7. The preparations of walnut-tree leaves exert, on the contrary, a sufficiently speedy action upon the sores and the fistulous openings, whether they are maintained or not by caries of the bones, excepting in persons of dry and nervous temperament. 8. Till the present time, the instances of strumous opthalmia which M. Negrier has observed, have been certainly and more rapidly cured by this method of treatment than by any other.—*Edin. Med. and Surg. Journal, Oct.* 1, 1850. *p.* 271.

6.—CONSTITUTIONAL ORIGIN OF ERYSIPELAS AND ITS TREATMENT.

By Albert J. Walsh, M. D., one of the Medical Officers of St. Peter's Dispensary, Dublin.

[The following are the observations of Dr. Walsh, founded on seven cases of traumatic, and fifty-six of idiopathic, erysipelas. He says,]

The predisposing cause of the disease seems to me to be a derangement of the liver and digestive organs, which gives rise to a peculiar kind of fever or constitutional irritation; this irritation nature attempts to get rid of by the erysipelatous inflammation of the cuticular surface. If the constitutional irritation be not sufficient to cause this inflammation, great anger, a blast of cold moist air, the application of any irritating substance to the skin, surgical operations, punctured wounds, ulcers, any abrasion of the surface, or other injury which in a healthy constitution would have either healed immediately or caused phlegmonous inflammation, will be sufficient to give rise to it.

These appear to be the immediate causes of erysipelas. We find that this peculiar state of the constitution is most frequently met with in those addicted to drink malt and spirituous liquors, and lead intemperate lives; also in those who are sedentary and subject to great depression of mind. We find also, that the state of the air has the power of producing this peculiar kind of fever, for the affection is most frequently in autumn, or in seasons when hot weather is succeeded by cold and wet. Patients in hospital often suffer from this constitutional irritation, from breathing confined and bad air.

I have come to the above conclusion, that erysipelas is a peculiar kind of fever, or constitutional irritation, producing an inflammation of the skin, or skin and subjacent areolar membrane, for the following reasons:—

First. The disease, like small-pox, measles, &c., is subject to metastasis. Second. There is always the same train of symptoms preceding and attending each case. Third. A very minute dose of tartar emetic, which would have comparatively no effect in other inflammations, generally causes severe vomiting and purging in this. Fourth. In mild cases, the disease will wear itself out; the part where the eruption first appeared getting well, while the disease is spreading to sound parts; and this continues until the system is completely rid of the poison which caused this peculiar fever. The patient then is in better health than for some time previously. Fifth. It often recurs in the same patient at stated intervals; or if a patient who has had an attack lives irregularly, he is almost certain to suffer from a recurrence of the disease. Sixth. That it is propagated by contagion will most probably be acknowledged, though I have myself seen but two instances; yet the observations of Lawrence, Copland, and others, appear to establish the point.

[Dr. Walsh divides the disease into idiopathic and traumatic. With regard to the treatment, Lane advises it to be treated on the purely antiphlogistic treatment, the most strenuous supporter of which is Mr. Lawrence; others, looking at it as a species of putrid fever, recommend tonics and stimulants, for which Dr. Fordyce is perhaps one of the strongest advocates. Dr. Walsh continues:]

Having mentioned the antiphlogistic and tonic methods of treatment, I shall now allude more particularly to the third plan, that recommended by Desault. He says: "In the bilious erysipelas, whatever degree of fever and heat may exist, I give, in the first instance, a grain of tartar emetic dissolved in a considerable quantity of fluid. The symptoms generally diminish as soon as the effects of the medicine have ceased. I have seen them entirely subside, although the medicine produced no other sensible alteration in the animal economy than an increase in the secretions of the insensible perspiration and the urine. Sometimes the symptoms resist the evacuations, and we are obliged to have recourse once or twice, or even more frequently, to the use of the emetic drink."—"Where the erysipelas is cured, and the bitterness in the mouth and fever have subsided, two or three purges of cassia and manna, with a grain of tartar emetic, are exhibited. During the treatment the patient is ordered to drink freely of a diluting ptisan acidulated with oxymel. As soon as the symptoms are mitigated, the diet of the patient is enlarged; for when it is too rigidly observed the acrimony of the humours is apt to be increased, and the bilious erysipelas to be reproduced, particularly in a hospital, where the air, generally speaking, is unhealthy. I have invariably observed that the cases of persons who had been bled previously to their admission into the hospital were more serious and obstinate, particularly when it had been frequently repeated. The same practice is not applicable to the phlegmonous erysipelas; in this kind emetics and other evacuants augment the irritation and tension already considerable, nor should they be had recourse to till the plethora and irritation of the patient are diminished by one or more bleedings, according to the urgency of the symptoms and the strength of the patient. The bilious erysipelas that then appears points out the necessity for evacuants, and the proper time for their exhibition."

I have now alluded to the different modes of treatment recommended both here and on the continent. The first and second are diametrically opposed; and the last agrees with the first, with this exception, that in it is employed an agent which, in my opinion, may be called a specific. But Desault says we are not to bleed in the bilious erysipelas, but to depend on the tartar emetic; in the phlegmonous, on the contrary, we are to bleed more than once if necessary, until we have reduced it to the bilious, and then we are to commence with the tartar emetic. Now in my opinion—an opinion borne out by the results of sixty-three cases of erysipelas which I have treated in the plan described in this paper—there is no form of the disease which should not be attacked from the first with tartar emetic, whether there be high inflammatory fever, low typhoid fever, vomiting, or purging; and under all and every circumstance we shall find that the disease yields to this remedy. But I must derstood to say, that we are not to give this medicine in large doses, as recommended by Richter and other practitioners, who adopt his plan of treatment; for then it produces too violent an emetic effect, causing much general irritation, which being superadded to the irritation of the disease, the beneficial effect of the remedy is prevented; but I advise it to be given in very small doses as recommended by Desault, which may have to be repeated three or four times, so as not to allow the action of the medicine on the system to subside, for if it does we shall very likely find the disease to make more rapid progress after the first check.

Tartar emetic appears to me to act specifically in erysipelas for the following reasons, which depend on its sensible effects:—In most cases it vomits and purges after the second dose, or it vomits only, or it purges only; and what is vomited is green bile, and the same is passed by stool. I have known the second dose to cause from twelve to fourteen stools of bilious matter, with a decided remission of the symptoms. Now I have ordered this medicine in the same proportion in other diseases, as in phlegmonous inflammation, without the least perceptible effect on the patient; I have given it in bronchitis without any visible effect; and in other diseases I have administered it in the same proportion, and have found no such violent action as I have invariably seen even in the mildest cases of erysipelas.

If, from what I have now said of tartar emetic, it is to be expected to cure every case of erysipelas when administered alone, disappointment will ensue, as all that it seems to do is to remove from the system the morbid matter which appears to have caused the disease, and which nature was attempting to get rid of; as soon as that is done we must give the patient tonics, either wine or porter, strong broth, bitters, bark, ammonia, or quina: of all these I have found the sulphate of quina the most successful. It may be asked, at what time are the tonics to be given? The general rule I would lay down is, that as soon as we find the erysipelatous surface to be getting a yellow tinge, and the skin shrivelling a little, the tongue cleaning, and the pulse, which generally falls under the influence of tartar emetic, becoming more frequent, the proper time has arrived to commence with tonics and omit the tartar emetic. In some cases where we have not so marked an improvement in the symptoms, and we are afraid the strength is failing, we shall have to commence the tonics, while we are still continuing the tartar emetic; and in other cases, where there are low typhoid symptoms, with prostration of strength, we shall have to give, with the tartar emetic, stimulants and tonics from the commencement.

While the patient is taking tartar emetic the bowels may be constipated, and we shall have to give some aperients: the saline aperients are what are generally recommended, but I usually order the compound rhubarb pill, with blue pill, in the proportion of three grains of the former to one of the latter, to be made into a pill; two of these to be taken for a dose, and, if necessary, to be repeated in six or eight hours. I prefer this combination, as it acts on the liver and large intestines.

[Passing on to the local means recommended in the treatment, Dr. Walsh says he is opposed to any local application, except in idiopathic erysipelas, in which flour or powdered starch may be used, but chiefly to gratify the patient, and in the traumatic form developing the part in a large linseed meal cataplasm. Discussing the other various local applications recommended, Dr. Walsh first mentions abstraction of blood by leeches, against which he says there is a great prejudice, as the disease often ensues from the bites; and he is opposed to the making incisions in the part, both as to the smaller but more numerous ones of Mr. Hutchinson, and the long one of Mr. Lawrence, believing that, at least in the great majority of instances, the antimonial treatment, if early adopted, will obviate their necessity. Dr. Fahnestock, of Pittsburgh, recommends the local application of the purest creasote: of the effects of this Dr. Walsh cannot speak. Prof. Velpeau recommends a solution or ointment, made of sulphate of iron; but considering all cases depending on some internal cause, Dr. Walsh does not believe it so available as the Professor supposes. The next local remedy mentioned is the nitrate of silver.]

Nitrate of silver has been recommended by Mr. Higginbottom, of Nottingham, to be applied over the entire of the inflamed surface. He says: "I have never in any case seen metastasis or any other bad effect from its use." He uses it in the following manner:—nitrate of silver, four scruples: nitric acid, six drops; distilled water, half an ounce; mix. This is to be applied several times on the inflamed parts, and for two or three inches beyond the inflamed on the healthy skin.

M. Piorry has recommended the use of linear blisters, by means of which he states that he has discovered a method of effecting the desired limitation of inflammatory action with great certainty. At the commencement of the disease he applies narrow blisters around the entire circumference of the inflamed skin, at the distance of one or two inches from its border. Nitrate of silver and solutions of sulphate of iron have been long used with the same view, but they have for the most part failed.

The only other application which I shall mention is mercurial ointment. This is to be smeared over the entire of the inflamed surface. It was first recommended by Ricord, and is still strongly advocated by some of our leading men.

The last is the only local application which, in my opinion, is worthy of consideration, as it acts not locally but constitutionally, for we know that in a very short time the system is affected by the mercury, and as soon as that takes place, the erysipelas gradually declines. But with respect to the other local applications, I consider that they are injurious without constitutional treatment, and with it unnecessary. As, if my ideas are correct, viz., that the erysipelatous inflammation is the method taken to throw off the morbid state of the blood, anything that tends to check that eruption will be the means of preventing the efforts of nature, and probably cause a metastasis to some other part of the body, it may be to a more vital organ, for we have on record many cases of metastasis of erysipelas to the brain, larynx, and pericardium.

As a summary of these remarks I would draw the following conclusions:—

First. That erysipelas is a constitutional disease, depending solely on a morbid state of the blood; and that the eruption and fever are the means nature takes to get rid of this poison. Second. That for all practical purposes, it is only necessary to divide the disease into idiopathic and traumatic. Third. That tartar emetic seems to act specifically in erysipelas, by assisting nature in her efforts to throw off the disease. Fourth. The best method of administering this medicine is by dissolving one grain in a quart of any bland fluid; the solution to be taken in the twenty-four hours. Fifth. That as soon as the tartar emetic has acted sufficiently, sulphate of quina, or some other tonic, is to be administered. Sixth. That if the patient is debilitated we must administer tonics at the same time that we give the tartar emetic. Seventh. That under this treatment the erysipelatous inflammation may spread, but not with the same violence, nor to the same extent, as if the disease were left to itself. Eighth. That we shall often require to give aperient medicine during the course of the case, as it is absolutely necessary to keep the bowels free. Ninth. That local applications are unnecessary, and often injurious. Tenth. That incisions are not necessary, except in the third, or suppurative stage; and if the antimonial treatment be early resorted to, it very rarely occurs that suppuration takes place.—*Dub. Quarterly Journal of Med. Science. Aug.* 1850, *p.* 50.

7.—RHEUMATIC FEVER TREATED BY LEMON-JUICE.

By R. Hamilton, Esq., Surgeon to Charing Cross Hospital.

Some few months ago, a long discussion took place at the London Medical Society, on the value of lemon-juice in the treatment of rheumatism, and its efficacy was by many denied. In the following case, Mr. Hancock having tried various remedies, as colchicum, calomel and opium, &c., without much benefit, prescribed it, considering it a good opportunity for testing its value. It has been for the last year or two, given at Guy's Hospital, and is very highly spoken of by Dr. G. O. Rees and Dr. Babington.

Ellen Wilson, a servant, aged 22, was admitted July 1st.

under the care of Mr. Hancock, with chronic disease of the inferior maxillary bone of nine years' standing. She was in Guy's Hospital a few weeks back with a slight attack of rheumatism, but was not treated with lemon-juice. About eight days after her admittance, she was taken very ill with pains in all the limbs, coated tongue, flushed face, headache, and sickness. She was ordered the wine of colchicum with magnesia, which she continued for some days without any benefit, the rheumatism shifting about from one joint to another; at one time the knees and ankles being much swollen, and exquisitely painful; at another the wrists and elbows; the tongue being coated with a white fur, the face flushed, and perspirations profuse. There was also some affection of the heart, the *bruit de souffle* being heard distinctly, though she complained of no pain or uneasiness in the chest; the pulse was also intermittent. Her medicine was then changed to the calomel and opium, two grains of the former to a quarter grain of the latter to be taken every four hours. To have also the ung. hydrarg. fort. rubbed into the thighs daily, and a blister to be applied to the chest.

Under this treatment the chest-symptoms subsided, but the pains in the joints remained as bad as ever.

July 18th. Mr. Hancock ordered half an ounce of the lemon-juice to be taken three times a-day, and to discontinue the other medicines.

20th. There is an abatement of all the symptoms, the pain in the knees decidedly less; the pulse 120 and full; prespires less; swelling diminished.

22d. Pulse 104, and weaker. Can raise her legs in bed; the tongue cleaner.

24th. Continuing to improve; the pains in the limbs almost gone, and is able to get in and out of bed without assistance.

From this time she continued to mend daily, and in about a week the lemon-juice was discontinued, and one grain of quinine, three times a-day, prescribed. Throughout the case, the urine was acid, and small in quantity; its specific gravity was not taken.—*Medical Times, Sept.* 14, 1850, *p.* 283.

8.—CASES OF ACUTE RHEUMATISM.

Under the care of Dr. BARLOW, at Guy's Hospital.

[The first case was that of a man aged twenty-six —strong and plethoric; and within the last three or four years having suffered from attacks of acute rheumatism, but cannot remember that the present one was brought on by exposure to cold and wet; hence from this case, the opinion, that when once the rheumatic diathesis is formed, the exciting causes of the attack are generally slight, receives an additional weight. On admission he had the various symptoms of rheumatic fever. But]

The heart's action being examined was found natural, with the exception of a slight systolic murmur heard over the interval between the fourth and fifth ribs, about an inch below the nipple. This patient having so repeatedly suffered from acute rheumatism, and being still young, it may be looked upon as probable that the pericardium was partly adherent, and that the murmur observed depended on valvular changes resulting from previous attacks of endocarditis. Still it is worthy of note that these symptoms were very slight, though at that age cardiac complications are very common. Dr. Watson says on that head—"The younger the patient is who suffers from acute rheumatism, the more likely will he be to suffer from rheumatic carditis."

The patient was now ordered six drachms of lemon-juice, to be taken in sugar-water, three times daily. He was, however, in a couple of days much worse; the pains were very acute, and the joints along the arms and hands became involved; the pulse rose to 120, full; the systolic murmur was more distinct; the perspiration profuse, very acid, and the urine high-coloured. Dr. Barlow, after giving a purgative draught, with wine of colchicum, prescribed a pill, composed of a quarter of a grain of tartar-emetic, half a grain of opium, and one grain of calomel, to be taken every fourth hour. These measures contributed to lessen the pains, and the patient was desired to take the pills only three times a-day, with the following draught:—half a drachm of acetate of potash, and ten grains of nitre, in camphor mixture. The improvement was very great on the next day; the pills were discontinued, but the mixture persevered in. The favourable impression produced by the salts of potash increased during the next few days; all the symptoms gradually gave way, and ten days after the draughts had been first taken, and regularly continued, the patient was convalescent. He took, before being finally discharged, small doses of iodide of potassium and carbonate of potash, and left the hospital quite well, about three weeks after admission.—*Lancet, Aug.* 24, 1850, *p.* 243.

9.—DISCOVERY OF CASEIN IN THE BLOOD.

By Dr. Panum.

[Dr. Panum ascertained on pouring some blood serum into a glass of water, that the mixture became whitish and opaque, like diluted milk and water. After performing various experiments to satisfy himself as to the true nature of this opaque deposit, it became evident, he says, that "being insoluble in water, ether, and cold alcohol, and being precipitated from its solution in acetic acid by ferro-cyanide of potassium, it possessed the character of a coagulated protein compound." He proceeds to say:]

The question arises, whether we can deduce any more accurate conclusions as to the chemical nature of this substance, beyond what we have already shown—that it is a *protein-compound, insoluble in water?* Fibrin has hitherto been the only constituent of the blood, which could be asserted with certainty, to possess the power of passing from a soluble to an insoluble state, whether in or out of the body. It has hence necessarily arisen, that an unlimited amount of physiological and pathological importance has been ascribed to fibrin. The albumen of serum can be brought, when out of the organism, to pass from the soluble to the insoluble state by various methods, such as heat, alcohol, and most acids, provided they act in a sufficiently concentrated form. But the circumstances, under which albumen is coagulated out of the body, can scarcely operate within it. The substance which has been described, is precipitated by simple dilution with water, and by acetic acid so highly diluted, that it may easily be imagined capable of being formed in the body itself. The manner in which fibrin coagulates in the form of filaments, the circumstances under which it passes from the soluble to the insoluble condition, and finally, the different manner in which it is affected by re-agents separate it so essentially from the substance which is being treated of, that the latter will have, in future researches, to be described as entirely distinct. I think it necessary to insist on this, on account of the confusion which has arisen from the description of many different things under the term fibrin: and this has become so important, that most have mistaken the primitive signification of the word fibrin, which, on physiological and pathological grounds, there is good reason for retaining, while there is no cause for rejecting it on purely chemical grounds.

This protein-compound is essentially distinguished from the albumen of serum, by being precipitated by water and acetic acid, which cannot coagulate albumen. It can scarcely be the product of a transformation of albumen; for after the substance precipitated by water and acetic acid has been removed, the liquid still contains a large quantity of albumen: indeed this appears more plentiful on boiling, than before the addition of acetic acid and the removal of the precipitated material. Besides, after this substance has been separated by filtration, water and acetic acid may be added in any proportions, without producing more sediment; but if the material were derived from the action of water and acetic acid on the albumen of the serum, there would be no reason why the transmutation should cease, after a certain quantity of albumen had been changed into its insoluble substance.

There can be then no doubt, *that our protein-compound is distinct from albumen and fibrin, and exists in the serum in a state of solution with the salts and alkalies, but is separated when the saline matter is diluted, and the alkali united with acetic acid.* This can only be asserted of deutoxide of protein, albuminate of soda, or casein.

We may, at least provisionally, regard the substance as casein, as its behaviour with acetic acid hitherto seems characteristic of that protein-compound. The diagnosis has depended only on this, in those instances in which casein has been *occasionally* detected in the blood. Gmelin was the first who thus found a small amount of casein in the blood, in some rare cases. Marchand next found it in some instances, both males and females. Finally Hunefeldt seems to have discovered it in cases in which the secretion of milk was arrested; but he does not state whether the precipitate formed by adding acetic acid was soluble in an excess, so that no certain conclusion can be drawn from his observations.

The reason why the constant presence of casein in the blood has hitherto escaped the notice of observers, appears from the circumstances already mentioned. Only when the amount of casein in the serum is very great, or the quantity of salts, especially phosphate of soda, is very small, can the casein be precipitated from undiluted serum by acetic acid. But when the proportion of saline matters to the casein is not so small, they retain the casein in the solution, even when it is separated by acetic acid from its combination with soda. It is only when the solvent power of the salts is weakened by dilution with water, that acetic acid can precipitate casein in any quantity; and even then the phenomenon escapes notice, unless very dilute acid be employed, otherwise the precipitated casein is re-dissolved in the excess of acid. When there is more casein in the serum than is combined with an alkali, so that some is held in solution by the salts in the serum, a portion is at once precipitated on the simple addition of water, and appears first as an opacity, and soon as a sediment. When it is not free, but united with an alkali, simple dilution with water produces no precipitate, until dilute acetic acid is added, which uniting with the soda, precipitates the casein as a substance insoluble in water.

The great importance which a material with these properties may possess, and very probably actually has, with regard to the healthy or diseased organism, render necessary a far more careful and extended series of researches on its chemical relations. Thus it will be of the first importance to discover a convenient method for performing its quantitative analysis, which has hitherto only been accomplished by an extreme dilution of the serum, and by the very careful addition of a highly diluted acid. It will also be important to determine whether carbonic acid alone can separate casein from its combination with soda. But the interest of the subject appears to me so great, that I have been led to publish my observations, imperfect as they are. It is, however, a point of the greatest interest with regard to physiology and pathology, that this material, which occurs in the blood constantly and in notable quantity, can be acted on by re-agents, which are constantly in operation within the organism; and that, after having been precipitated by them, it can be re-dissolved by many different salts.

A number of important questions here arises: but I can only refer to a few of them.

The relation which this substance may bear to the process of nutrition and cell-developement, in health and disease, can scarcely yet be accurately determined. There are, however, some points which tend to show that this relation must be very important. The following are some of them: (1.) The method in which cell-developement is generally performed, commencing, as is well known, by the formation of molecules in the clear mother-liquor. (2.) The facility with which the casein is precipitated from the clear serum in the form of molecules, by re-agents which are constantly in action with the organism —a peculiarity which is possessed by no other of the known constituents of the blood. (3.) The agreement in chemical properties between casein and the cell membranes of the blood-corpuscles, and of the globules of milk and pus; which agreement is so great, that several chemists have described those cell-membranes as a modification of casein. Finally, (4.) The remarkable faculty which casein possesses of inducing transmutation in organic substances may lead to a well-grounded suspicion that it acts in the same way within the limits of the organism.

In the next place, it will be very interesting to point out the relative quantity of casein in the blood during lactation: and it will likewise be very important to point out the proportion which it bears to the other constituents of the blood, and to the ingesta.

In a pathological point of view, it will be highly important to observe what relation the amorphous molecular mass, which is in notable quantity in nearly all pathological exudations and deposits, bears to this substance, which may be very well imagined to play a principal part in a great number of organic diseases. Perhaps also, the solvent and antiphlogistic action of saline medicines in many of these diseases will find an easy explanation, in their faculty of dissolving the deposits of this morbid material. In the meantime, it is not to *hypotheses*, but to new *researches*, that we are to look for a solution of the many important questions connected with this subject.—*London Journal of Medicine, July*, 1850, *p.* 685.

10.—THE END AND FINAL CONDITION OR PURPOSE OF THE RED GLOBULES OF THE BLOOD.

By Dr. Hassall.

Everywhere throughout the solid constituents of the animal organisation cellular tissues abounds; it forms the basis of every texture and organ of the body. It is, therefore, scarcely to be wondered at that the opinion should have been adopted, that the globules which exist in such vast numbers in the blood, were to be regarded as the primary and even parent cells, out of which all the solid structures of our frame took their origin. This theory, to the mind of the earlier micographer, must have appeared very rational and seductive; and so great, indeed, is the plausibility with which, even in the present day, it is frequently invested, that it is still able to claim a few adherents.

If we regard with the utmost patience and attention the beautiful spectacle of the capillary circulation in any of the more transparent parts of animals, but especially in the tongue of the frog, we shall in vain look for the escape from their containing vessels of even a single red blood-corpuscle, independent of a rupture of those vessels. In a normal state, therefore, the blood-globules are never free, but are always enclosed in their own proper receptacles.

A communication, however, between the fluid contents of the blood vessels and the tissues lying external and adjacent to them, is doubtless established. through the operation of the principle of exosmosis, whereby a slow exudation of the fluid fibrin of the blood is perpetually going forward. Now it is the opinion of most of the German physiologists, and it is the view best supported by facts, that this fluid fibrin is to be regarded as the true *blastema*, out of which all the different elementary tissues and structures of the body proceed; and this not by any power inherent in itself, it being, as respects the final form which it is made to assume, totally inert and indifferent, and which form is impressed upon it by a *vis insita*, or peculiar power and faculty belonging to each organ and structure of the animal fabric.

While the fibrin circulates in the blood it retains its fluid form; soon after the cessation of the circulation, and whether within or without the system, it passes from the fluid state to the condition of a solid; now, on the principle of endosmosis, which has to be so often referred to in the explanation of numerous phenomena, in the solidifying power of the fibrin, and the *vis insita* of the different tissues, we recognise the chief and fundamental causes which regulate nutrition, growth, and secretion.

It would thus appear that the globules of the blood (the red globules are more particularly alluded to) are not to be regarded as either cytoblasts or primary cells, forming by direct apposition the solids of the body; and that, therefore, they do not express the last degree of elaboration of which the fibrin of the blood is susceptible.

Again, then, we have to ask ourselves the question, what is the end or final condition of the red blood-globules? Direct observation is wanting to aid us in the solution of this difficult inquiry, which, however, admits of an indirect reply being given:—we have seen that no means of egress from the blood-vessels is, under ordinary circumstances, permitted to the red blood-globules, and, therefore, we are driven to the conclusion, that, having performed the important function to which we have already alluded.—viz., that of carriers of oxygen from the lungs throughout the system, and of carbon from the latter back again to the lungs,—they become dissolved, increasing by their dissolution the amount of fluid fibrin circulating in the blood, and which is deemed to be the true *blastema*.—*Edin. Med. and Surg. Journal, July*, **1850**, *p*. 183.

11.—NON-IDENTITY OF FLESH AND BLOOD FIBRIN.

Liebig has lately made some important observations on the properties of the fibrin of the blood and of flesh substances, which have erroneously been considered to be identical. The two substances behave in very different ways when treated with water, acidulated with 1-10th per cent. of hydrochloric acid.

Blood fibrin swells into a gelatinous mass,—corrugated by addition of acid,—recovering its gelatinous consistence when water is again added. Flesh fibrin, on the contrary, dissolves completely, the solution being rendered turbid only by some fatty particles, which can be separated by filtration; when neutralised, the fibrin coagulates to a thick white mass, soluble in excess of alkali. Common salt added to the alkaline solution produces a coagulum soluble in excess of warm water; the white mass produced by the neutralisation is also soluble in lime-water, and the solution, when boiled, yields a coagulum like a dilute solution of white of egg. In some kinds of flesh,—as in veal and mutton,—in addition to this fibrin, there is another substance, insoluble in water, acidulated with hydrochloric acid.

Blood fibrin contains more nitrogen than flesh fibrin, hence Liebig doubts whether it serves for the formation of the latter substance. Blood fibrin has other remarkable properties: thus, when completely immersed in water, it rapidly putrifies when the vessel is placed in a warm place. The fibrin in about three weeks dissolves completely, forming a slightly coloured solution. which is indistinguishable from a solution of albumen; not only does a coagulum form when heated, but the coagulated substance. as appears from an analysis of Dr. Strecker, actually possesses the exact composition of albumen ($C_{53 \cdot 9}$ $H_{6 \cdot 99}$ $N_{15 \cdot 83}$ $S_{1 \cdot 59 - 1 \cdot 45}$ Ash $_{9 \cdot 28}$). After the coagulum has separated, an azotized substance remains in solution.

Liebig observes, that blood fibrin always contains iron, which can be found in the white ash left on incineration.—(Abridged from the *Quarterly Journal of the Chemical Society*, July 1850, *p*. 188.)—*Medical Times, August* 10, **1850**, *p*. 151.

12.—ALKALINE NATURE OF THE SERUM OF THE BLOOD.

The study of the blood has, within the last few years, assumed the rank which it was entitled to hold in medicine; but the great difficulty of the subject has hitherto prevented the investigators from arriving at any very practical conclusions. One point, however, seems to be clearly made out, viz., that mere quantitative analysis of the blood's elements will never lead to any great discovery in pathology. This arises principally from the rapid manner in which certain elements of the blood in the living body appear to be transformed the one into the other. Thus it would seem that fibrin and albumen are really but modifications of one and the same principle; and, if this be the case, we shall have to determine, not the relative proportions of fibrin and albumen in a given quantity of the vital fluid, but the conditions under which one form may be transmuted into another.

In a learned memoir, presented at the last meeting of the Academy of Medicine, M. Cohen discussed many interesting questions connected with this subject. The following are the principal conclusions at which the author arrives:—

In a state of health: 1. The serum of the blood holds in solution a substance which subsequently separates into albumen and fibrin. The albumen and fibrin may be transformed, one into the other, by artificial means. 3. When fibrin is treated with a weak solution of soda at 40°, it loses its properties, and is changed into a substance which it is impossible to distinguish from albumen.

In inflammatory affections:—4. The fibrin is increased, the albumen diminished. 5. The increase of the former is equal to the diminution of the latter. 6. The quantity of the salts of soda is diminished. 7. On adding a small quantity of a solution of soda, we re-establish the normal proportions between the albumen and fibrin. 8. The serum of the blood is less alkaline. 9. The increase of fibrin depends on the diminished alkalinity of the serum.

In putrid diseases:—10. The serum is more alkaline than natural. 11. The fibrin is diminished and this diminution depends on the increased alkalinity of the serum.

From the above we can deduce the theory put forward by M. Cohen. Fibrin is nothing but a normal excess of albumen in the blood, which the alkalies of the serum, saturated with albumen, are unable to dissolve. A diminution of the alkaline principles of the serum will, therefore, increase the quantity of albumen; or increase of the alkalies will diminish it, and *vice versâ* for the fibrin. The practical deductions to be drawn from the observations, if they be correct, are that alkalies are indicated in inflammatory affections, and acids in putrid ones.—*Medical Times, July* 27, 1850, *p.* 98.

DISEASES OF THE NERVOUS SYSTEM.

13.—THE NERVOUS SYSTEM.

By Dr. Marshall Hall, F. R. S., &c., &c.

[In some of our previous volumes we have repeatedly referred to the views of this eminent physician on this interesting subject. During the present year he has published a "Synopsis of the Spinal System," which we will take the liberty of making use of in order to circulate more widely such of his opinions as may appear to us to throw light on the practical departments of our profession. Dr. Hall first commences by explaining certain terms which are frequently used in his treatise. The following anatomical relations are essential to the understanding of his views:]—

A nerve leading *from* the point or part irritated, *to* and *into* the spinal marrow: The spinal marrow *itself*; and a nerve, or nerves, passing *out of* or *from* the spinal marrow,—*all in essential relation or connexion with each other*.

On these anatomical facts I have ventured to institute a new nomenclature, descriptive of what I have hitherto designated *The Spinal System*, and expressive of these essential points.

The term peristaltic (from περι and στέλλω, to contract) is familiar to us all. It may be justly extended to all the movements of the interior organs, as the heart, the stomach, the large and small intestines, the uterus, &c. These movements, it is well known, are independent of the spinal marrow. But it has been shown that a series of experimental phenomena, and it will be shown hereafter that a series of important functions, are effected by means of the series of nerves in essential connection with the spinal marrow, to which I have adverted. The action or act is performed *through* the spinal marrow as its essential centre. I propose to designate the phenomena by the term *diastaltic*.

The spinal system may henceforth be designated—*The Diastaltic Nervous System*, a designation which will have the advantage of including this system in the invertebrate as well as the vertebrate tribes of animals. This system embraces a peculiar anatomy, physiology, pathology, and therapeutics.

Perhaps the only *purely* diastaltic function is *Respiration*; and this is variously modified by volition and influenced by emotion. But there are many other functions which partake of *both* the diastaltic and peristaltic character. Such are the functions of the immediate conduits of injestion and of egestion;—the œsophagus, the rectum, the uterus. These functions are *dia-* and *peristaltic*.

We are much in need of other terms still, to aid us in this investigation. The terms incident excitor and reflex motor have been used to designate those nerves whose influence proceeds *to* and *from* the spinal marrow. But they have never appeared to me satisfactory, and I have long wished for others more expressive and explicit. The following compounds of *ὁδος*, a way, have appeared to competent judges very appropriate to our subject: esodic (*εσω*) will express the action *into*; exodic (*εξω*) the action *out of;* anodic (*ανω*) will express the *ascending*, cathodic (*κατα*) the *descending*, course of action; pollodic (*πολυς*) and panthodic (*πας*) will express the facts, on which I shall shortly have to dwell at considerable length, of the action of the *vis nervosa* from each *one point* of the diastaltic system, in *many*, or even *all* directions, to *every other*.

[Dr. M. Hall, in the third section of his work, first makes some general observations on]

The Anatomy of the Diastaltic System.—In treating of the *Anatomy* of the diastaltic system, it is my intention to display, not the results of dissection by the scalpel, with or without the microscope, but of *experiment*,—not mere tissues, but organs and phenomena.

The great, the important division of the nervous system, is, into its in-excitor or astaltic, and its excitor and staltic portions. The former embraces the cerebrum and cerebellum, and the olfactory, the optic, and the acoustic nerves; the latter, the tubercula quadrigemina, and the new *Class* of the esodic nerves, the spinal centre, and the exodic nerves. All this is but the expression of fact, the result of experiment and observation, all hypothesis being excluded.

Volition is seated in the inexcitor portion of the nervous system. The seat of emotion is so too, but approaches the excitor.

Whatever the *precise* limits of the different parts of the nervous system may be, there is no doubt that volition is seated higher in that system than emotion, and emotion than pain.

The hemiplegic attack, which severs the influence of volition from the arm, leaves that of emotion on this member entire; and it frequently happens that the patient is a prey, as it were, to uncontrollable laughter or tears.

Even when the whole encephalon is removed in an experiment on the rabbit, the sole medulla oblongata excepted, cries, unequivocal expression of pain, are induced by pinching the foot or the tail severely with the forceps. And as the sense of touch is seated in the cerebrum and cerebral nerve of touch, so I think there are reasons to believe that the susceptibility to *pain* resides in the *medulla oblongata* and the system of *ganglionic* nerves. These reasons will be given hereafter.

In the case of the atrophy or defective development of the brain in idiots, the passions and appetites are developed in proportion as the intellect is defective.

Below perception and volition, then, emotion and passion are seated; below these are seated excitability and diastaltic action—the diastaltic system. Evenly with both the latter, we have the peristaltic and secretory system. The influence of emotion is shed over the spinal and the ganglionic systems.

There is the same *kind* of evidence for the nerves of each of these systems, dissection, and experimental fact. No one doubts that the optic is the nerve of sight: as little can any one doubt that the trifacial is an excitor diastaltic nerve.

The late Sir Charles Bell treated of what he designated a "Nervous Circle," defining it thus: Between the brain and the muscle there is a circle of nerves; one nerve conveys the influence of the brain to the muscle, another gives the sense of the condition of the muscle to the brain.

I think this view an error. I believe we have no consciousness of the condition of individual muscles, or sets of muscles, as we have no power of acting on such muscles. The sense, sometimes denominated the muscular sense, is, I believe, not in the muscle, nor in any sentient muscular nerve, but in the nerve of touch, or of vision; and volition is not directed to any muscle, or set of muscles, but to the aim, object, and purpose of their contraction. We are guided in our voluntary actions, not by muscular sense or nerve, but by the sense of touch or of vision, by the *cutaneous* or the *optic* nerves.

There is a class of phenomena in some cases of paralysis, which, I think, throw a ray of light on this subject. If there be loss of sensation in the fingers, the patient lets any object held by them escape and fall, unless the eye be continually directed towards them, to regulate the force of muscular contraction. If a patient have lost the power of sensation in the feet, he cannot walk in the dark; the eye is essential to the due action of the muscles of the lower extremities. I have a patient afflicted with partial paraplegia, who has no power of *balancing* himself without the aid of the eye. We have only to consult our own consciousness to be aware that "the nervous circle is not between muscle and muscle, but between one sentient nerve, whether of touch or of sight, and another. The sensation does not ascend from the muscle, nor does volition descend to it; but the former arises from a nerve of sense—of special sense—and the latter is directed to an aim or purpose, in attaining which the former is the *guide*."

[He next makes the following remarks on]

The Spinal Marrow.—The first opinion respecting the spinal marrow was that still retained by Unzer—that it is a mere chord of cerebral nerves. The cerebrum and spinal marrow are still designated the cerebro-spinal axis, as being the common centre of the cerebral system.

Legallois treats of the spinal marrow vaguely, as possessing the "prerogative" of being the seat of *sensation*, and, at the same time, of the *life* of the trunk, and of its regions respectively. The former opinion is an error; the latter, unconsciously on the part of this admirable author, sets forth its influence as the centre of the ganglionic system.

M. Flourens was the first clearly to distinguish between the cerebrum and the spinal marrow as an in-excitor and excitor—a distinction of the utmost moment in physiology and pathology, as in diagnosis.

Legallois first singled out the medulla oblongata in its important and essential connection with respiration.

The next step in the progress of neurological science was that suggested by Walker, taken by Sir C. Bell, and confirmed by Professor J. Muller. Sir C. Bell was of opinion that the posterior columns of the spinal marrow and the posterior roots of the spinal nerves are destined for *sensation*, whilst the anterior columns and roots are subservient to motion.

Legallois first called the attention of physiologists to the distinct influence of distinct *segments* of the spinal marrow over the corresponding segments of the trunk. Mr. Mayo and others have also taken this view of the subject.

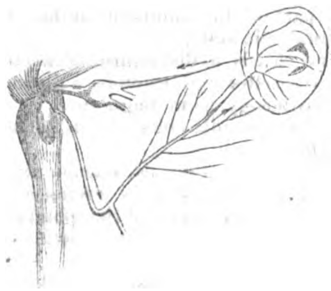
Such was the condition of our knowledge of the anatomy of the nervous system when I entered on its investigation in 1830—an investigation which led to an entire distinction of the spinal system from the cerebral and the ganglionic, distinct at least in its application to physiology and pathology. It was during this investigation that I discovered a *special nervous arc*, consisting of an esodic and anastaltic nerve, *essentially linked* with a special portion of the spinal marrow, and *through* this with an exodic catastaltic nerve and *special muscles*. It was during the continued investigation of this subject that I observed that this nervous act is not simple, but very multiplex, and that it is not one exodic nerve merely which is associated, through the spinal marrow, with the esodic nerves, but that nerves exodic in *all* directions are so associated. The course of excited action may be traced along each and all of these *nerves*. But in what part of their tissue, and along what particles of the spinal marrow, their influence extends, we are utterly ignorant. As each esodic spinal nerve serves for sensation and for conveying diastaltic action, it has been supposed that it contains distinct *fibres* for each of these two offices. And as the same exodic nerve conveys the impulse from volition and diastaltic action, it also has been supposed to contain *two* appropriate sets of fibres. The same opinion has been extended to the columns of the spinal marrow. Experiment alone can determine such questions definitely; pathology does not afford such distinct isolation of tissues, so as to establish their special and exclusive functions; and, in the present instance, I fear that even experiment is inadequate to the task. It is during the *progress* of diseases of the nervous system that our knowlege of its physiology is useful, by enabling us to *interpret* the symptoms, and to determine the *Diagnosis*.

The conclusions at which I have arrived may now be stated in a few words: 1. Within the spinal marrow there is a *special Nervous Centre;* 2. To this centre are essentially attached certain *special Esodic and Exodic Nerves;* 3. These together constitute a system of *Diastaltic Nervous Arcs;* 4. The whole of these, taken together, constitute the *Spinal or Diastaltic Nervous System*, viewed anatomically.

Physiology of the Diastaltic System.—*The Diastaltic Nervous Arc.*—The anatomy of the diastaltic system consists in an esodic nerve, the spinal centre, and an exodic nerve, *essentially linked together*, and constituting a *diastaltic nervous arc.* The physiology of this system consists in such an arc, or such arcs, in diastaltic action. An appropriate stimulus applied to any part of this diastaltic nervous arc, induces muscular contraction. In the *physiological* relations of this *arc*, the stimulus is always applied at its incipient esodic portions, or *origins*, in the cutaneous or mucous surfaces. In its pathological relations, the source of irritation may be situated in any part of this arc, origin, centre, or termination.

I here adduce three examples of diastaltic arc, for the sake of clearness.

I. The Diastaltic Arc of the Iris.

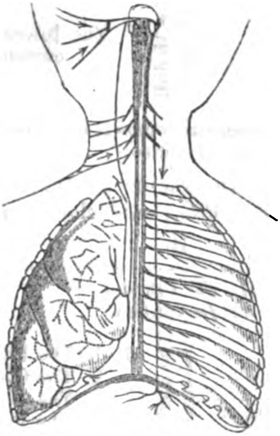


I. *The Excitor.*	II. *The Centre.*	III. *The Motor.*
1. The Excitor portion of the Optic Nerve. 2. The Trifacial.	The Tubercula Quadrigemina.	The Motor Oculi.

II. The Diastaltic Arc of the Eye-lid.

I. *The Excitor.*	II. *The Centre.*	III. *The Motor.*
The Palpebral branch of the Trifacial.	The Medulla Oblongata.	The Orbicular branch of the Facial.

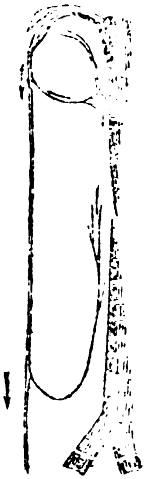
III. THE DIASTALTIC ARC OF RESPIRATION.



I. *The Excitors.*	II. The Medulla Oblongata.	III. *The Motors.*
1. The Trifacial,		1. The Intercostal,
2. The Pneumogastric,		2. The Diaphragmatic,
3. The Spinal, Nerves.		3. The Lower Spinal, &c.

Of all the diastaltic nervous arcs, that by which the larynx is closed is the most simple, whilst that by which deglutition is accomplished is the most complex.

THE DIASTALTIC ARC OF THE LARYNX.



I. *The Excitor.*	II. *The Centre.*	III. *The Motor.*
The Superior Laryngeal.	The Medulla Oblongata.	The Inferior Laryngeal or Recurrent.

The upper part of the pneumogastric nerve is thus diastaltic, and both esodic and exodic, in reference to the spinal centre.

THE DIASTALTIC ARC OF DEGLUTITION.

I. *The Excitors and Motors which* close *the Larynx.*

II.

I. *The Excitors—*	II. *The Centre— of Deglutition.*	III. *The Motors—*
1. The Glosso-Pharyngeal ? 2. 1. The Pharyngeal— 2. The Œsophageal— 3. The Cardiac—branches of the Pneumogastric.	The Medulla Oblongata.	1. 1. The Pharyngeal— 2. The Œsophageal— 3. The Cardiac—branches of the Pneumogastric.

III. The immediate Excitors of Peristalsis in the Œsophagus.

IV. The Excitors and Motors which open the Cardia.

This complexity will appear the greater, when we reflect that, in deglutition the act of closure of the larynx is added to that of the contraction of the pharynx and the œsophagus, and to that of relaxation and opening of the cardia.

A similar state of complication of action occurs in the uterine system and its auxiliaries in parturition, and, in a slighter degree, in the evacuation of the rectum, the expulsors being excited, and the sphincters relaxed simultaneously.

But in *respiration* there is, besides the excited act of inspiration, a sustained and continued influence by which the thorax and diaphragm and the abdominal muscles are kept in a state of equilibrium, as it were, in every stage of the double act of respiration—inspiration and expiration: so that, in the *physiological* condition of this function, nothing is abrupt, nothing laborious, nothing audible even, but all is accurately rhythmic and equable. How different, in cases of pathology, is the varied, irregular,—*diagnostic* condition of this important function.

All this is effected through those *diastaltic arcs and acts* which I have attempted to describe, and which now take their place in the science of *Anatomy* and *Physiology* for the first time.

Guards of the orifices and exits.—Besides the acts of *injestion* and of *egestion*, of which I have briefly treated in the last section, there are other acts or actions by which certain objects are *excluded* from, or *retained* in, the system.

The contraction of the iris, and the closure of the eyelids exclude too intense light; that of the larynx excludes certain irritant and noxious gases. The sphincters contain the contents of certain organs, the cardia those of the stomach, the sphincter ani and the sphincter vesicæ those of the rectum and bladder.

In this manner certain esodic nerves become the *guards*, as it were, of certain organs. These I have thrown into the form of a *Table;* thus:

I. *The Trafacial guards—*
  1. The eye.
  2. The Nostril, the Ear in the Cetacea.
  3. The Fauces.

II. *The Pneumogastric.*
  1. The Larnyx, the Bronchia.
  2. The Pharynx, the Cardia
  3. The Ureter, the Gall-duct.

III. *The Spinal Nerves.*
  1. The Rectum.
  2. The Bladder.
  3. The Vesiculæ Seminales.
  4. The Uterus.

[Thus Dr. M. Hall considers that the diastaltic system, amongst other func-

tions, especially *guards* the *borders*, the *orifices* and *exits*, the *sphincters* of the body. On the *interior* of these borders, this system is in general, tubular, and in these parts of it the action is not purely diastaltic. Thus, according to Dr. J. Read.]

If the pneumogastric nerves be divided above the origin of the superior laryngeals in the rabbit, the principal part of the parsley eaten by the animal remains in the œsophagus; a few leaves are all that reached the stomach. On the other hand, I myself observed that, if the œsophagus, thus replete with food, be placed on the table for observation, that food is slowly and gradually expelled by peristaltic action.

The act of deglutition in the pharynx and œsophagus is, therefore *dia-* and *peri-* staltic.

The same remark doubtless applies to all the *tubal* acts of ingestion and egestion, and especially to those of the rectum and the uterus. The *degree* in which these acts are diastaltic and peristaltic respectively is, as yet, unknown.

[The whole subject of *peristaltic actions* is reserved by Dr. Hall for a future investigation, and is not entered upon in this work. Conception and parturition are also principally diastaltic spinal acts, but neither does Dr. Hall enter minutely into this branch, but refers us particularly to the investigations of Dr. Tyler Smith.]

THE PATHOLOGY OF THE DIASTALTIC SYSTEM.—[On this subject Dr. Hall justly considers that a knowledge of the diastaltic system is one great means of advancing the pathology of the diseases of the nervous system.]

The cerebrum and cerebellum are astaltic, or inexcitor. No disease *limited* to these can, therefore, be attended with *spasm*. The tubercular quadrigemina are excitor with a *crossed* effect. The medulla oblongata and the medulla spinalis are staltic or excitor, *without* crossed effect. *Irritation* of these organs induces spasm, on the side affected. The dura mater and other internal membranes are diastaltic; that is, they excite muscular actions *through* the medium of the spinal centre. Hence, dental, gastric, intestinal, or uterine irritation may excite diastaltic convulsive disease. Dental irritation, acting through the spinal centre, in which a morbid degree of excitability is induced, is seen in its effects on the muscles of the eyes, the fingers, the toes, inducing strabismus, and spasmodic flexion. The features, the neck, and the limbs, are distorted in succession. The larynx is closed, and there are morbid efforts of the expiratory muscles. The consequence is, compressed veins of the neck, and congested encephalon.

Similar phenomena are observed in the adult, from gastric, enteric, uterine irritation, the affection receiving, wrongfully, the formidable designation of epilepsy. That of epileptoid would be more just and more appropriate.

Similar phenomena occur, constituting the various forms of puerperal convulsion.

Lastly, *similar* phenomena take place from organic lesion within the cranium—a case to be carefully distinguished from the former.

THE DIASTALTIC SYSTEM IN RELATION TO DIAGNOSIS.—It is by the absence of these phenomena from the beginning that we determine the limitation of disease of the cerebrum to that organ, or its extension, in influence or actual lesion, to the spinal marrow.

I may mention hydrocephalus in infants, and apoplexy in adults, as examples of this fact. In the commencement of the former, the symptoms are cerebral and obscure; but, as the disease advances, staltic or spasmodic action *denote* and almost *measure* the fact. In apoplexy, the respiration is frequently stertorous, and there may be dysphagia, or there may be various convulsive affections of the limbs. If these symptoms subside, we may conclude that the disease originates in cerebral congestion, which is receding, and with it the immediate danger; but if they remain permanent, we must fear that the disease is formidable organic lesion, and will prove fatal.

I have already observed that diseases of the cerebum, *limited* to the cerebrum, cannot induce *spasm*, this organ being *in*-excitor. But, in the case of congestion or other lesion, there may be tumefaction of its structure, and counter-pressure on the medulla oblongata, and consequent affection of the larynx be borne in mind, in employing galvanism as a *test* of the irritability of the muscular fibre.

What is the most probable good or therapeutic effect of galvanism? It may excite the failing *heart* in asphyxia or syncope, and the *uterus* in inertia of this organ. It may *exercise* the nervous and muscular system, and so restore them, in some measure, from atrophy and debility. It is, in *this* manner, useful in the paralysis remaining after the organic cause of the disease may have been removed. It may be useful in paroxysmal paralysis, in paralysis of the facial nerve from cold, in some hysteric forms of paralysis, &c.—*Synopsis of Diastaltic Nervous System.*

[In the above paper we have endeavored to place before the reader the most interesting remarks of Dr. Hall, which are scattered over a volume of 100 quarto pages. We advise the reader to procure the whole treatise for himself.]

14.—PHYSIOLOGY AND PATHOLOGY OF THE GANGLIONIC NERVOUS SYSTEM.

By James George Davey, Esq., Licentiate of the Royal College of Physicians, &c.

[In the preceding notice of Dr. Marshall Hall's treatise on the nervous system, little or no reference is made to the ganglionic system of nerves. The following paper by Dr. Davey may fill up this desideratum; and although a long one, it is, from its novelty and originality, well worthy of attentive perusal, notwithstanding the startling views which it explains.]

"The object of the following paper," says Dr. Davey, "is to prove that *Life* is the function of the *Solar Plexus*, regarding it as the *root* of the ganglionic or sympathetic system. That the *Solar Plexus* is the *impetrum faciens* of Hippocrates or the *meteria vitæ* of Hunter; that it is the *organ* whose *function* may be represented as the principle or stimulus which enables every other and subordinate part in the animal economy to continue its specific and allotted labour towards the existence of the individual; that both the brain and spinal cord, in common with all the viscera, hold a similar relation to, and dependence on, the *solar ganglion*, as the centre of the ganglionic system, that the iris does to the retina, or the external senses do to particular parts of the cerebral mass; and these opinions the author has privately circulated for the last *ten* years—that is, since 1835—as is well known to many medical friends and acquaintances. I am aware that Dr. Stevens has also advocated some such views; but it cannot be doubted that the *priority* is not with him."

Introductory remarks on the Nisus Formativus, or the Solar Ganglion.—The physiologist, if I mistake not, will consider that my position, as explained in the advertisement to the reader, must derive no inconsiderable confirmation from the circumstance, that the solar ganglion is that particular portion of our organism which is first formed in utero, and therefore may be really considered as the *germ* of all the phenomena to be afterwards developed.

Nothing can appear more reasonable than that that portion of our organism, from which every other takes its character and vitality, should enjoy a prior existence. The egg precedes the chick, and the specific vitality of the former is impressed on the latter. The foundation is erected before the house, and the design of the architect, it may be added, is not unfrequently to be anticipated by an early examination of it. Muller says, in his Physiology, translated by Dr. Baly, that "Ackermann asserts that the sympathetic nerve is the part first formed in the fœtus." Rolando moreover declares what has been usually considered as the first traces of the vertebræ at the sides of the spinal cord, in birds, to be the ganglia of the sympathetic nerve. The assertions of Ackermann and Rolando acquire great weight from the testimony of such men as Blumenbach and Gall; both of whom add the authority of their illustrious names, and confirm the former-named physiologists in their opinions. Blumenbach says, "The nervous system," meaning the organic nervous system, "of the chest and abdomen, are fully formed, while the brain appears still a pulpy mass," and refers to Gall's writings for the same views. He adds: "These ganglia and nerves would hardly be formed before the brain and spinal marrow, but for the sake of the organs which they supply, and the functions of which (with the exception of the genitals) are as perfect at birth as at adult age, while the mind and brain are slowly perfected."

Ackermann, Rolando, Blumenbach, and all, all maintain, then, as I have shown, that the ganglionic or organic nerves of the abdomen and thorax are the first formed in the embryo. Now it is extremely unlikely that the development and formation of the solar ganglion—the centre and source of the organic nerves and their anastomosing branches—should be preceded by "*organic nerves;*" their dependence on it, it may be said, is analogous to the dependence of the branches of a tree on its root; and I therefore would claim for the solar ganglion a like precedence. Viewing the matter in this light, it is readily seen that the solar ganglion itself is, in the embryo, nothing more nor less than the *nisus formativus* of Blumenbach, and that, like it, it excites, even in its rudimentary existence, the elaborated fluids of the successful coition, and like it, it vivifies and shapes the hitherto shapeless spermatic matter partly into the beautiful containing ovum, and partly into the contained embryo.

The *nisus formativus*, we are told, occur to the genital matter, when this is mature, and committed to the uterus in a proper condition, and under proper circumstances, produces in it the rudiments of conception, gradually forms organs fitted for particular purposes, preserves this structure during life by nourishing the body, and reproduces, as far as it can, any part, accidentally mutilated.

The "nisus formativus," says Dr. Elliotson, in a note, "produces a being generally resembling the parents, but occasionally different." It is understood, then, that exactly what Blumenbach and Elliotson, in common with other physiologists, claim for the nisus formativus, I claim for the solar ganglion. I cannot doubt that it exercises the *architectural* power which is employed in man and animals—from man downwards, through the whole of animated nature to the very lowest link in the chain of being; that to its peculiar and vital influence must be conceded, upon the grounds before stated, the wonderful and successive metamorphoses or changes which characterize, not only the intra- and extra-uterine existence of the human form, but also that of animals, whether oviparious or viviparious, and under circumstances both of normal and abnormal action. No one, I think, would presume to explain the *modus operandi* of this power or influence of the solar ganglion; it is sufficient for my purpose that it exists. This question is involved, equally with that of the *cause* of gravitation or attraction, in a too Cimmerian darkness for my optics to penetrate.

If, from any cause, the organic affinities in progress in the fœtus be interfered with—if the balance which must obtain in the distribution of the imponderable matter in the organic tissues be disturbed, the action of the organism and of the separate organs may be so modified as to give rise to the formation of some one kind or other of monstrosity. An injury done to a seed during its germination is seldom unattended with ill effects. The radicle or plumule will, the one or the other, suffer, and perhaps both. The injury done may be confined to one of these parts, and yet it may very seriously affect the vital principle in operation, and so modify or aggravate the original mischief. It is just so with the fœtus; any abnormal change in the component matter of any of its parts may prove irremediable, and the effects of which being then communicated to the solar ganglion, may excite so altered a vital action in it as to prove incompatible with the complete or normal development of either itself or of those parts dependent on it; and hence the existence of monstrosities, of acephalous, and other malformed children, among whom the physical characters of the biped are more or less substituted by those of beings lower in the scale of creation. "Human monsters," says Blumenbach, "are not unfrequently met with who strongly resemble the form of brutes;" and it is, "because the '*nisus formativus*,' having been disturbed and obstructed from some cause or the other, could not reach the highest pitch of the human form, but rested at a lower point, and produced a bestial shape." He adds, strangely enough—"On the contrary, I have never once found among brutes a true example of monstrosity which, by a bound of the *nisus formativus* bore any analogy to the human figure."

It may be asked, in the history of monstrosities, did any physiologist ever hear of *one* in whom there was no ganglionic system, no *solar ganglion?* I answer, no! Such an occurrence is wholly impossible. We have all heard of acephalous children, and of beings created without either *brain* or *spinal cord.* What, in such instances, sustained intrauterine life? what enabled the body of the creature to be nourished and developed? What, I ask, was the source of all this vitality? The solar ganglion and its branches, the ganglionic nerves! "In fœtuses, without *brain* or *spinal marrow*," says Blumenbach, "the circulation, nutrition, secretion, &c., proceed *equally* as in others, which, besides spinal marrow, nerves, and ganglion, possess a brain," and for the same reason, he might have added, that "after the removal or destruction of the *brain* and *spinal marrow* in animals, the heart still continues to act, and the blood to circulate, provided respiration is artificially supported." The *reason* is just this, the *solar ganglion* and its immediate dependencies are unaffected. With these *facts* before us, then, I must confess I am in ignorance of the "*experience*" which, "shows that when the influence of the brain and spinal marrow is intercepted, although the afflux of blood may for a time continue, yet the secretion ceases, and all the functions dependent upon secretion, such as digestion, cease likewise." We are informed, too, by the same author, strangely enough, that "the functions of digestion, circulation, absorption, secretion, and all those included under the class of nutrient or vital functions, are carried on as well during *sleep* as when we are awake," that is, as well during the total *inaction* of the *brain* and *spinal marrow*, when the "*influence*" of both must of course be "intercepted. Strange *experience* this.

Dr. Marshall Hall, in his Lectures, published in 1842, "On the Pathology and Treatment of Nervous Diseases," evidently favours the opinion that the influence of the brain is necessary to the complete performance of the vital or ganglionic functions. "We find," says Dr. Hall, "that idiots with small brains are short-lived;" therefore "the animal functions cannot go on permanently independent of the brain." I take it that the imperfect development of the brain of the idiot must be regarded, only, as an indication of the mal-organised condition of the entire nervous system, including the spinal and ganglionic, not less than the cerebral.

In the very interesting case of acephalous monstrosity published by Mr. Lawrence, in which the brain *only* was wanting, we learn that all the excito-motory functions were duly performed; it gave evidences of pain, and "at first moved very briskly," and the sphincters performed their office. Such, of course, was referrible to the integrity, generally, of the spinal cord. "The child's *breathing* and *temperature* were natural; it discharged *urine* and *fæces*, and took food." The latter set of circumstances indicated the operation of the functions of the solar ganglion and its collateral parts; *and without any aid from a brain.* The ganglionic and spinal nervous systems were natural, and they exercised their respective functions accordingly.

In the remarkable case cited by Dr. M. Hall, of a fœtus born "without either brain or spinal marrow, without a particle of either of these organs *yet perfectly developed*;" we have a very satisfactory proof of the independence of ganglionic functions on either the spinal or cerebral nervous systems. The intra-uterine life may be quite perfect, although there may be neither brain nor spinal marrow: but what happens the moment the child is born? asks Dr. M. Hall. "It cannot breathe: it cannot live an instant." It dies truly, but not because the brain or the spinal marrow, or both, are directly essential to the continuance of the function of the solar ganglion, but because that central organ in the absence of the motor nerves commonly supplied to the respiratory muscles, is deprived of one most material agency or power with which it, the solar ganglion, is enabled to perform one of the many indispensable functions required by the animal economy. The blood cannot, under such circumstances, be decarbonized, and the circulation of diseased blood paralyses the vital energies of every part of the organism. The effect is the same if a person with his cerebro-spinal and ganglionic systems entire, be made to breathe carbonic acid or any other irrespirable gas. Life, then, in such a case of monstrosity, cannot be said to cease from the want of any direct *cerebral* or *spinal* influence. The vital actions in the lower classes of animals which have no brain, and in those, too, which have neither brain nor spinal marrow, are not less completely performed than the same in man. Secretion, circulation, digestion, &c., are as elaborately and efficiently executed in the polypus and oyster as in man, and their breathing apparatus is more simple, and independent of any addition to the *organism*, whereby, in man, the nature of his dependence on, and relations to, the external world are explained. His responsibility then came to be understood, and his real position as a moral being to be justly appreciated.

The experiments of Dr. M. Hall, as given in his published Lectures, appear to me to be anything than satisfactory. He introduces the subject thus:—"Until very recently, we viewed the contents of the spinal canal as a cord of cerebral nerves, and the origin of a part of the ganglionic system. Now, it is very possible to remove the cerebrum, the centre of the cerebral nerves, and the *ganglionic system*, and yet leave *another kind* of nervous influence remaining in the animal body. I shall take this early opportunity of showing you a simple experiment. You see here an animal (a frog) from which the head has been separated, and of course I need not tell you that with the head the brain has been entirely removed; all the viscera have also been removed, and with the viscera every portion of the ganglionic system: Now I beg here to repeat, the cerebrum, the centre of the spinal cord of nerves, and all the ganglionic, have been removed from this animal, and yet, when I pinch the extremity, it moves so as to be obviously perceptible at the remotest part of this theatre. Thus, as I said before, we have here removed the centre of the cerebral system, and the entire ganglionic system. The brain, which we know to be the centre of all the sentient and voluntary nerves, has been removed, the ganglionic system has been removed, and yet you observe something remains. Now, gentlemen, that which remains I venture to call—in contradistinction from what has been termed a cord of cerebral nerves, and the origin of the ganglionic system—the *true spinal marrow*. It is plain, in the first place, that it is not a mere cord of nerves; if it were a mere cord of nerves, you might divide it, and then you would intercept its influence. But, if you observe here, this influence passes not only from one extremity to the other, but it also passes from the one set of extremities to the other set of extremities; thus, it is quite plain that there is a nucleus of nervous matter between the two anterior extremities, and another nucleus between the two posterior extremities by which these nervous links are united and associated in their motions one with another. Having thus, then, clearly laid before you the distinction which I wish to insist upon—namely, that there is not a division of the nervous system into two parts only, but into three, pervading all the different parts of the whole animal frame, I shall venture to term them the cerebral, the true spinal, and the ganglionic systems."

That Dr. Marshall Hall is perfectly right in considering that the contents of the spinal canal do *not* constitute a cord of cerebral nerves, and the origin of a part of the ganglionic system, there can be, to my mind, no doubt; but I cannot allow this opportunity to pass by me without claiming for the illustrious Gall the honour of being the *first* to render this anatomical fact clear and distinct. *He* it was who demonstrated that the spinal marrow only *communicates* with the brain.

Dr. Hall has endeavoured, as it appears in the preceding extract, to prove by experiment on the frog, that on the removal of the viscera with the solar plexus and its ganglia, the spinal cord will still continue the excito-motory functions, the head (and of course the brain) being at the same time dissevered from the body, and which circumstances of course, would prove, as the doctor affirms it does, "that there is not a division of the nervous system into *two* parts, but into *three*, pervading all the different parts of the animal frame." I have on many occasions performed the experiment on the frog as detailed by Dr. Marshall Hall, but *I* have invariably found that the removal or destruction of the ganglionic system of nerves is fatal to the *life* of the animal.

The vital or "*true spinal*" phenomena, in that case, continue no longer than the peculiar contractile irritability of the heart or extremity of the animal after the removal of either from the trunk; proving, therefore, most clearly, that the original power possessed by the spinal cord to perform its peculiar functions is derived from the ganglionic system. If the animal be *not* decapitated, the same result follows the removal or destruction of the solar ganglion, and which could not be the case if the influence of the *brain* were directly required by the spinal marrow. My own experiments, then, prove not only that there are *three* distinct nervous systems united in man—viz., a cerebral, a spinal, and a ganglionic, but also that both the first and the second are dependent on the third—that they derive not only their very existence and integrity from it, but also perform their respective functions in virtue only of the influence they receive from it, and that they are, as it were, employed by it to establish our dependency on, and relationship to, the external world, of which man forms a part.

The *cerebral* and *spinal* systems of nerves together perform the animal functions, which, in the words of an eminent physiologist, prove us feeling, thinking, and willing beings; they are the actions of the senses, which receive impressions of the brain, which perceives them, reflects upon them, and wills; of the voluntary muscles, which execute the will in regard to motion; and of the nerves, which are the agents of transmission: the brain is their central organ. But the ganglionic system of nerves, with the solar plexus for its central organ, performs the vital or organic functions, or rather, supplies to each viscus the power which enables it to perform its specific functions in the animal economy. Secretion, nutrition, exhalation, and absorption, being, then, under its immediate influence and control, it must preside equally over the brain, as the stomach, equally over the spinal cord as the liver. In short, the vital force of the solar ganglion, the centre of the ganglionic system, holds the same relation to the whole organism that *steam* does to the several parts of an engine. The said "*vital force*" and "*steam*" are equally the motive power, and it may be said, that to their different states or conditions must be attributed every kind of change, however slight, of which either the animal organism or the machine itself is at any time, and under any circumstances, susceptible.

The observations already made in reference to acephalous and other monstrosities, no less than those which relate to the experiments of Dr. M. Hall and myself, abundantly prove the physiological position I have here taken—viz., that *life* regarded as the "assemblage of all the functions, and the general result of their exercise," has its immediate principle neither in the brain nor in the spinal marrow, nor in any of the viscera of the chest or abdomen, but in the *solar ganglion;* yet it is no less certain, that all these parts or organs are necessary to the maintenance or continuance of life, as it exists in man, and the great mass of the lower classes of animals. The brain, principally, because the mechanical phenomena of respiration seem to depend upon it,—the spinal marrow, because it exercises a guardian power over the acts of ingestion and egestion; and the viscera of the chest and abdomen, because they are necessary to the formation and circulation of the blood.

The only way that I am enabled to account for the discrepancy stated in the experiment of Dr. M. Hall and myself on the frog, is, that the excito-motory action which was produced by pinching or pricking the extremities of the animal, after the removal of the viscera and the ganglionic nervous system, must have resulted from the influence of that remaining nervous principle which exists, for a longer or a shorter period, in any portion of the animal organism, after, even, its removal from the trunk or body to which it originally belonged. It is well known that Le Gallois, Prochaska, and Hunter, taught that the nervous power is generated throughout the whole extent of the nervous system, even to the smallest nerves, and that it can exist, *for a certain time*, in the nerves of any part, independently of its source: and there can be, I think, no doubt of it. I have seen the heart of the *shark* contract vigorously, for even many minutes after its removal from the animal,—a fact which proves, in the words of Hunter, that the nerves of a part continue the same action which they receive.

From the preceding observations it will appear that the "*formative power*" of Blumenbach, or the *materia vitæ* of Hunter, or the *solar ganglion*, call it by what name we will, is no less universal than the animal organism itself; and there can be no doubt that, like the animal organism, it observes corresponding varieties and gradations of form. It could hardly be expected that the "*formative power*" of the dog is similar to that of the man; or that of the fish, of the reptile; and so on, through the whole of living things. The germ and its product must possess qualities common to both. It is impossible, perhaps, to demonstrate the *exterior* or physical characters of this "formative power" in man or in animals, peculiar either to the same or to different species of each genus; yet is there an abundance of authority to show that such a specific difference must everywhere exist. The formative power, or the solar ganglion, regarded as the germ of all to be afterwards developed, may be said to represent, in common with the cerebral and other parts, in its successive changes in *utero*, its various and permanent conditions as they exist throughout the animal kingdom, beginning with the polypus, in which every vital action is conducted upon the smallest scale, by the least refined methods, and with the strictest economy of means; its apparatus being the simplest, the agents employed the fewest possible, and its various operations being carried on in one and the same place; proceeding in the mollusca, and in worms and insects, in which relations are exhibited to surrounding objects, and in which animals the senses and voluntary motion gradually make their appearance, the organic apparatus necessary to the exercise of these functions being superadded; ascending through fishes, reptiles, birds, and quadrupeds, in which the powers of sensation and motion become much more energetic, much more active, the internal life at the same time more and more developed, and the cerebral functions more and more numerous and diversified; and ending with *man* himself, in whom, as Blumenbach observes, the successive imposition of cerebral matter has reached its maximum; so that the summit of the nervous system, which corresponds with the forehead and vertex, is much larger in him than in any brute, and his intellect and moral feelings are proportionally greater.

Apropos, the comparative cerebral development of man and brutes is, as is well known, employed to mark the rank any one of either kind may hold in the scale of creation and intelligence; and very properly so; but it appears to me that the physiologist takes cognizance only of an *effect* on the development of the cerebral organism, which has resulted from the operation of a cause which he has hitherto failed to appreciate. Nothing can be more true than that "the higher we ascend, the more parts exist above the *medulla oblongata*, till, rising from fish and reptiles, through the numerous warm-blooded brutes—all distinguished by the relative magnitude of each cerebral part—we arrive at man," the "*summit of terrestrial objects;*" and it is equally true to my mind, that the successive increase of parts above the medulla oblongata is attributable to the operation of a preliminary cause—viz., the *Solar Ganglion, the source of all animal life, whether cerebral, spinal, or organic*. Surely if the ganglionic system be deemed either necessary or competent to preside over the vital actions necessary to the perfect development of the amyencephalous monster of Dr. M. Hall; if the secretion, nutrition, circulation, &c., as carried on in it, in virtue of the said ganglionic system, are sufficient for its growth and maturity, and for the perfectibility of its several organs, as the liver, spleen, heart, &c., and the consequent exercise of their functions, why should we doubt its powers to preside over the vital actions necessary to the entire fœtus? If the ganglionic system be sufficient to develop and mature a liver, a heart, and a spleen, and to excite them to the exercise of the appropriate functions in the animal economy, there is no reason why it should *not* do the same for the brain and spinal marrow. There certainly is much reason, as I trust has been shown, to feel satisfied that it does so; and that, moreover, to the modified operation of the solar ganglion must be referred all the varieties of life, psychical and corporeal, which everywhere abound.

To proceed:—On tracing the animal organization from above downwards, we observe generally a gradual diminution or simplification of parts, and which in every case is proportionate to the wants and adaptation of the animal. The decreasing cerebral organism, for instance, marks the downward progress of the animal in the scale of intelligence and feeling. This is seen throughout the vertebrated animals, as the mammalia, birds, reptiles, and fishes. The insect tribes generally can hardly be said to have more than a mere rudimentary brain; they have certainly a medulla oblongata, in which the nerves of the external senses take their origin. The spinal system, so far, is perfect in all its parts, and all the strictly vital functions are in full operation. In the annelida, however, we mark a very considerable falling off: the absence of everything like a brain, and of the external senses, leaves the animal to exercise only a strictly spinal and ganglionic existence. The excito-motory function, in itself, seems perfect, and like it, the organic functions appear on a par with those of the mollusca. The only advantage of the annelida is probably in its means of progression. One more step downwards, and the ordinary medusa is seen a mere mass of living gelatinous matter, without the least indication of even a spinal life, and nevertheless executing the organic functions of assimilation, digestion, secretion, circulation, nutrition, absorption, &c. This last step of the ladder constitutes the first of the intra-uterine life of the fœtus; and it may be said, that just so many steps as it takes the physiologist to trace the successive and organic changes from man to the medusa, the same are required to trace the fœtus through its various metamorphoses during its intra-uterine existence; and there can be no doubt, as has been before observed, that each diminution or addition of parts, both in man and animals, is but the visible effect of a corresponding variety and gradation of the *nisus formativus*, or the *solar ganglion*, the *germ* of all to be afterwards developed.

> "First chain of being, which from God began,
> Nature's ethereal, human, angel, man,
> Beast, bird, fish, insect, what no eye can see,
> No glass can reach, from infinite to thee:
> From thee to nothing." POPE.

It may be added that the possession of the *three* nervous systems in man and in the higher order of animals does not pre-suppose that those which have only *two* or even *one*, have been insufficiently provided for. The organism of the polypus and the oyster is as nicely adapted to their wants and the circumstances which surround them, as is the organism of man.

In many instances among the lower classes of animals it appears that nature has intended so to economise her means that one part shall serve the purposes of two or even more, and in others she has so concentrated her forces that it is really astonishing. The reproduction of lost parts in the lobster and crab, and many other crustacea; and the extraordinary activity of certain of the external senses in some animals higher in the scale of organization than the crustacea, almost make one doubt on which side to consider the advantages! A division of labor is generally regarded as indispensable to perfectibility, but among the lowest classes of animals we find the opposite principle in operation;—thus the solar ganglion in certain animals executes the functions of both the spinal cord and the cerebrum; for in the absence of the brain and spinal cord, it is occasionally seen that both sensation and voluntary motion exist in the zoophytes. In the manner in which the infusoria and actiniæ pursue their prey, and in their selection of it; in the facility with which they recede from whatever may prove hurtful to them, and turn aside when they encounter one another, together with the highly sensitive and irritable nature of the organism of the medusuriæ generally; "we can hardly fail," as Dr. Roget truly observes, "to recognise the evidence of voluntary action." Herein we get at the nature of animal *instinct*, and which, in the absence of everything like a cerebrum and spinal cord, must be regarded as a specific function of the ganglionic system. Dr. Roget says, in his chapter on the "Comparative Physiology of the Nervous System," page 538, "But whatever may be their extent, it is probable that the *sensorial operations* of the zoophytes take place without the intervention of any *common* centre of action," meaning thereby that the *sensorial operations*, so-called, are performed independently of a brain. The same may be said of the mollusca and articulata. There are times, moreover, when the *vertebral animals*, as fishes, reptiles, and birds, including the mammalia, and even *man*, perform actions of an instinctive and intellectual character, and that, too, *without the intervention of any common centre of action.*

What is the course of that instinctive agency which determines the young among the several classes of animals above enumerated, including man, to seek each its particular means of support. In what originates the very keen *choice* which is displayed by all of them for that which nature has so especially predestined for their respective uses? What determines the peculiar habits and mode of life of any one of them? The immature condition of the brain in the infant being renders it perfectly impossible that it can exercise any, even the slightest, influence in the matter; and no one could venture to affirm that the spinal cord took any part in it. There can be no *reason* to doubt, but, on the other hand, every *reason* to feel assured, that to the same cause of the "*sensorial operations*" of the zoophytes, and of that peculiar instinct which enables the lower classes of animals generally to provide, not only for all the necessaries of life, but even to guard against contingencies and anticipate difficulties, whether they relate to the kind of habitation, the mode of progression, or to the kind of food required for their sustenance; in a word, to the same cause, the formative power or solar ganglion, which so beautifully adapts their individual habits, pursuits, and inclinations, to their peculiar organic conditions, and so providently harmonizes the natural laws, must also be referred whatever of *instinct* is, at any time, manifested in *man*, including the vertebrated animals.

The sudden and peculiar shrinking of the *hydra* when under the influence of fear, and the extreme caution and dexterity displayed by the infusory animalculæ in avoiding obstacles of any kind while swimming together in myriads in a single drop, are *instinctive* vital actions, arising from an inherent preservative principle derived from the solar ganglion, and similar in its nature to that which induces even us, in the *moment* of danger and doubt, to place our extended palm across the præcordia—thus the affected Miss, though ignorant of physiology or pathology, and perhaps of all other *ologies*, if either alarmed, or professing to be so, at any sufficient or insufficient cause of personal danger, quickly applies her hand to the præcordia; as if the solar plexus screamed "*take care of me now.*" What more reasonable than to expect that that organ, the sum of whose function may be in one word described as *life*, should preside over actions of the kind mentioned above, so *indispensable as they are to both its integrity and well-being!*

The *instinctive* and *mental* (cerebral) faculties are occasionally seen acting in combination—*e. g.*, the martins which, in a spirit of retaliation and vindictiveness, built up the hole which had access to the nest that certain sparrrows had robbed them of, and so buried alive the predatory occupiers in a grave of their own seeking, afford an instance of a clear and distinct process of thought, of cerebration. The original construction of the nest was instinctive or ganglionic, but the subsequent act was certainly cerebral; whilst both were perhaps of a decidedly "*intellectual character.*" Dr. Darwin tells the following anecdote:—"A wasp on a gravel walk had caught a fly nearly as large as itself Kneeling upon the ground I observed him separate the tail and head from the body part, to which the wings were attached. He then took the body part in his paws, and rose about two feet from the ground with it; but a gentle breeze wafting the wings of the fly, turned him round in the air, and he settled again with his prey on the gravel. I then distinctly observed him cut off with his mouth, first one of the wings, and then the other, after which he flew away with it unmolested by the wind." Now, I take it that the mere pursuit and selection of the fly by the wasp as its prey was an act purely *instinctive*, whilst the clipping off of the wings under the circumstances narrated shows *it* to have been cerebral.

The constructive habits of the bee, as shown in the mathematical accuracy with which each cell of the honeycomb is formed, are certainly ganglionic or instinctive in their nature and origin; if the same structure had even been conceived and executed by man, it would have been an act of the brain, and an equal perfection of it could only have resulted from habit and experience Similar observations will apply to the beaver, and not less so to many birds, &c.

Such must be directly seen to be the legitimate and only conclusion, from the fact, that in some animals, without even a vestige of brain or spinal marrow, analogous phenomena are presented to our attention; the ganglionic system in them, as in the amy-encephalous monster of Dr. M. Hall, is the only power of any kind they can command; they possess none other, and therefore must it be conceded, that the "sensorial operations," so called, are occasionally performed independently of a brain; and what is more, "the actions which are at one time instinctive, may at another spring from a different principle."

Before proceeding to consider in detail the physiology of the solar ganglion and its dependencies, it is perhaps desirable to offer a few observations on the anatomical relations and dependencies of the three nervous centres. These will, it is hoped, facilitate the right comprehension of those physiological remarks which follow.

The brain, the spinal cord, and the solar ganglion, regarded respectively as the centres of the several nervous systems of man and the higher animals, though executing distinct functions in the economy of life, are, by means of the innumerable ramifications of their subordinate parts, and their union each with the other, brought into so close a connexion, that their physical separation is a matter of impossibility. Though not *mutually dependent*, they nevertheless exercise such a reciprocity of action, that the health and well-being of man is to be regarded as inseparable from their union. The solar ganglion, brain, and spinal cord, may be together, not inaptly, compared to an ordinary tree, the root, trunk, and extremities of which may be said to severally represent them; for the first has been the source, and continues to be the life of the other two; it has existed without them, and might again do so, though during their integrity it fails not to be the recipient of their toil, so to speak. The *root* will sometimes live on without the trunk and its extremities, and so will the paralyzed idiot. By referring to an engraving of the principal part of the organic nervous system, or sympathetic nerve, the anatomical connexions of the ganglionic with the spinal nerves, throughout the entire length of the cord, will be distinctly made out. It will be seen that each of the several ganglia, whether cervical, dorsal, or lumbar, gives off communicating branches with the individual spinal nerves, thus uniting the two systems.

The solar plexus, the centre of the organic nervous system, is therein demonstrated as formed by the union of the the two semilunar ganglia. It is described by Mr. Erasmus Wilson as "*a gangliform circle*," from which branches pass off in all directions, like rays from a centre. It gives off distinct filaments, which accompany, under the name of plexuses, all the branches given off by the abdominal aorta. Thus we have derived from solar plexus the—

Phrenic plexuses.
Gastric plexus.
Hepatic plexus.
Splenic plexus.
Supra-renal plexuses.
Renal plexuses.
Superior mesenteric plexus.
Spermatic plexus.
Inferior mesenteric plexus.

However, the principal nerve of the solar plexus is the great splanchnic. It arises from the upper and back part of the organ, and proceeding upwards, pierces the diaphragm immediately to the outer side of each crus, ascends in front of the vertebral column, within the posterior mediastinum, and terminates by dividing into five branches, which severally proceed to the sixth, seventh, eighth, ninth, and tenth dorsal ganglia. The pelvic viscera and the lower extremities are supplied with their organic nerves from the hypogastric plexus and sacral ganglia. The union of the ganglionic and spinal nerves would, in itself, be sufficient to establish a connexion between the former and the cerebrum and its nerves. They have, however, a more direct communication, by means of the ascending or carotid branch of the superior cervical ganglion, which, having entered the carotid canal with the internal carotid artery, divides into two branches, which form several loops of communication with each other around the artery, which constitutes the *carotid plexus*. Now, the carotid plexus is the centre of communication between all the cranial ganglia; and, being derived from the superior cervical ganglion, between the cranial ganglia and those of the trunk; it also communicates with the greater part of the cerebral nerves, and distributes filaments with each of the branches of the internal carotid, which accompany them in all their ramifications. As each of the cranial ganglia, moreover, communicates freely with the cerebral nerves distributed about the head and face, exteriorly and interiorly, it follows that nothing more is required to establish the anatomical position which has been taken. I may add, nevertheless, that the pneumogastric nerve or vagus, by being distributed to the respiratory and digestive apparatus and heart, where it forms communications with the organic or vital nerves, as well as with the solar ganglion itself, by means of a small branch, which is represented in plate 19 of Mr. Wilson's work, before quoted, as being given off by the principal trunk, where it turns forward to be lost on the anterior surface of the stomach, yet more effectually secures the relationship between the cerebrum and the solar ganglion, the centres of their respective systems. The phrenic nerve, also, in being formed by the union of filaments from both the cervical and sympathetic nerves, and in being further distributed to the diaphragm, provides for the same end.

The anatomical relations of the several nervous centres, as above explained, Mayo strangely regards as a reason why the "sympathetic nerves in human beings can only be regarded as branches of the cerebral and spinal nerves destined for particular uses.

I have before treated of the "*nisus formativus*," of its nature and uses, as well as of its general independence of the brain and spinal cord. and I have therefore, to some extent, anticipated the observations I had to offer "*on the physiology of the solar ganglion*." The reader will, I hope, excuse me if I recapitulate in a general way the line of argument there found.

In the first place, as regards the acephalous and amyencephalous monstrosities of Lawrence and Hall,, we have the most conclusive evidence of the independence of the organic or ganglionic system of nerves on the cerebro-spinal system. We have a convincing and irrefragable assurance that the function of the solar ganglion and its dependencies is in itself as completely performed without the brain and spinal cord as with them. Who in looking to the acephalous, the brainless monster reported by Mr. Lawrence, would venture to declare that the influence of a *brain* was necessary to *life*; that *it* was anything more than an instrument *of* life. And who, in looking to the amyencephalous, to the brainless and marrowless monster described by Hall, could dare affirm that either the brain or the spinal cord were in themselves indispensable to existence; that is, to *life*. In both instances we are shown facts, which demonstrate to us as plainly and conclusively as can be demonstrated, the perfect and normal operation of the vital principle. We see the body nourished, the viscera perfected, and the bony fabric matured; and we are assured, therefore, that circulation, absorption, and nutrition, have been in full operation; in perfect action, without either a brain or spinal cord. It is truly absurd for Muller or any other physiologist to declare that "the *anatomy* of these monsters is *not* at present known with sufficent accuracy for any '*conclusion*' to be drawn from it."

The same cause which enables the abdominal and thoracic viscera of brainless and marrowless monstrosities to continue their functions, the identical source from which the heart and its vessels receive their power to circulate the blood; the liver, to secrete its bile; the stomach, to digest its contents; the intestinal absorbents, to take up the chyle; and the kidneys, to secrete their peculiar fluid, also empowers the organism of the decapitated animal in which the spinal cord has been also destroyed, to continue its specific action; the "*ultimate cause*" of the several phenomena of *life* is in both instances the same. "Clift saw the heart of a carp continue to beat eleven hours after the destruction of the spinal cord;" and Muller tells us that "in fishes the contractions of the heart continue for the space of half a day after the destruction of the brain and spinal marrow." The same author obstinately adds, "that the brain and spinal marrow must nevertheless be regarded, as the principal source of the nervous influence; the cardiac nerves, under such circumstances, still retain a portion of the motor influence."

In the instance of the frog experimented on by Redi, which lived "six complete months" after the "removal of the whole brain," as well as that of the animal operated on by Sir B. Brodie, in which the posterior part of the spinal marrow was removed, without affecting in any degree the strictly *vital* actions natural to those parts which receive their nerves from it, would Muller venture to assert that, in either case. the phenomena observed were referrible to the circumstance of the retention of a certain power or principle of action, originally derived from either the brain or the lost portion of the spinal cord? Impossible! Nothing is more certain than that the destruction or *removal* of the solar ganglion and its dependencies is immediately fatal to the functions of the brain and spinal cord, no less than to those of the other corporeal organs, as the liver, stomach, &c.; and it is equally true that the destruction or removal of either the brain or spinal cord, or even of both of them, *if effected with care*, may be accomplished without impairing the energy of the ganglionic system. If you destroy the brain and spinal marrow of a frog, you will not *kill* the animal; the heart will still continue to beat, and the digestive process be carried on. A slight blow on the epigastrium, *over the solar ganglion*, will sometimes kill a man, but extensive injuries of the brain and spinal marrow are not unfrequently borne with comparative impunity. Pressure on the solar ganglion of dog or cat or rabbit, will quickly destroy life; and if it be carefully made over the upper part of the *lumbar region*, where the experimenter will avoid the solar ganglion, the lower extremities will become completely paralyzed: the animal will merely draw them after him, as if they were but artificial appendages. Remit the pressure, and in a few minutes the spinal functions are restored, and the animal is as lively as ever. This, in itself, is a beautiful illustration of the dependence of the vitality of the lumbar spinal cord on the contiguous ganglia of the sympathetic. In the lowest classes of animals, we see the existence of the same nervous organism without the addition of parts which characterize those higher in the scale of being; in them there is observed a ganglionic system only, and therefore it is that they execute functions purely preservative. We may ask, if a ganglionic system be deemed sufficient for the vital actions of one class of beings, why should it not for another? Digestion, circulation, secretion, absorption, &c., are no more perfectly performed in man than in the oyster or medusa. *Life*, then, is identical throughout inanimate nature, and if a particular nervous power be held sufficient in one instance for the effects observed, why should it not in another, or even in all? There is this difference between the lower and more perfect animals; that whilst in the latter the vital principle is, it would appear, generated in a central organ, and from it diffused through the organic nervous system, in the former it is, I apprehend, produced equally by all the ganglia of the sympathetic; and therefore it is that, "the divisions of these animals into separate fragments does not destroy the organism, but, on the contrary, gives rise to the production of several distinct beings." It would seem that the addition of a spinal system to a ganglionic, as in the annelidæ, constitutes the limit within which nature allows the divisibility of the vital principle. "The articulate, although, like the annelidæ, they have a ganglionated nervous cord, do not continue to live when thus divided." The first possesses, in addition to ganglionic and spinal nerves, a medulla oblongata, from which nervous branches arise which furnish the animal with the use of its external senses; and these establish so indissoluble a connexion, and so direct a dependence on the external world, that the facilities which the animal enjoys more than compensate for the loss of the other property. A step is, moreover, made towards that more perfect organism wherein the increase in number and complexity of its parts tend, in an eminent degree, both to establish the responsibility of man, and to explain the nature of those physical laws to which *man* must submit, if he would avoid the many miseries which now press on him from all sides.

We may, with much propriety and truth, regard the permanent condition of the medusa, for instance, as characteristic of the temporary, or accidental, or acquired condition of *man*. In the very early period of fœtal life, we observe nothing more than a gelatinous shapeless mass, in which the microscope can nevertheless discover a nervous ganglion or ganglia. *Life*, in both, is complete. This is man's temporary condition; the same is permanent in the polype. In the amyencephalous monster—that is, the brainless and marrowless fœtus—we see the ganglionic life of the medusa accidentally occurring; and similarly so in the animal which has been deprived of its brain and spinal marrow; as well as in the individual under the influence of animal magnetism; when, as oftentimes happens, the cerebral and spinal functions are completely obliterated, and the patient, of course, lost to all consciousness and feeling, realizes the precise condition of one in a *profound* sleep.

From the observations already made, both in this and the preceding chapter, it is seen that the nutrition, growth, and reproduction, no less than the decay, of the organism, must be attributed to the operations of the organic nervous system. That the nutrition of all parts of the body, in conformity with the original type, presupposes the persistence of that power which originally produced all the distinct parts, all the organs, as "members of one whole," as parts necessarry to our idea of the being; and which is present in the germ before any distinct organs are formed, while the animal exists merely "potentially."

Nutrition, then, is the continued reproduction, as it were, of all parts of the animal by this internal power: but in the adult the reproduction can be effected only by the process of assimilation—that is, by the union of new matter with the assimilating parts; while in the embryo, in which no organized "groundwork" as yet exists, the parts are formed, their "groundwork" is in fact created, by the *formative power*, which is still undivided. "For although, until the whole body perishes, all the organs are directed by *one formative principle*, which produces the concurrent action of all assimilating tissues, and the operation of which we admire, as the vis medicatrix naturæ, in the correction of the subtile material changes which are induced by disease; yet organised parts of the body, once formed, cannot, in most cases, if wholly destroyed, be again restored by this power, this vital organising principle," (Muller,)—which emanates from the solar ganglion, the central organ of the ganglionic nervous system.

The observations made by Muller in treating of the influence of the nerves on nutrition, are singularly contradictory. His argument is to the effect, that although the nutrition of monsters "is by no means defective," but their development up to the period of birth, even *perfect*, yet "is there no proof that the sympathetic nerve has a more especial influence on *nutrition* than the cerebro-spinal nerves, except, perhaps, the fact that the nutrition of a part does not cease when the nerves which it receives from the brain or spinal cord are divided"—a fact, which *I* must ever regard as a sure indication that the organic nerves can be none other than the nutrient nerves. Such is the inevitable conclusion. Why, it may be asked, does an injury or disease of the superior cervical ganglion arrest the nutritive processes in the eye. The branches of the third, fourth, fifth, and sixth pairs of nerves, usually distributed to the contents of the orbit, are untouched, and nevertheless, the eye loses its vivacity, and becomes *disorganized*. We have, then, in these instances, as in many more, both *positive* and *negative* evidence of the truth of my position—viz., that the solar ganglion is the SEAT OF LIFE; and that by means of its dependencies the vital principle is diffused through the organism. Further, in order to show that the organic nerves do not influence nutrition, he, Muller, says, "Where any organ is wanting, there is always a corresponding absence of their *nerves*," meaning their cerebro-spinal nerves, "absence of the eyes is attended with absence of their nerves." This is a mere assumption, and to prove it so, I beg to offer for the consideration of the reader the following *extracts* from a report of my own to be found at page 293 of vol. ii. of 'The Lancet' for 1835 and 1836, concerning the post-mortem examination of a child born without eyes: "On raising the anterior lobes of the cerebrum, but *one* olfactory nerve was seen, and that was on the left side; the optic commissure was placed more posteriorly than natural: the sella turcica being much anterior to it. From its forepart, and in the median line, the rudiment of a nerve was continued, it was of a loose texture, and of a scarlet hue, as if from injection of its vessels. It proceeded into the substance of the pituitary body, in which it was lost. Several small bloodvessels passed through the foramen opticum; the fissura lacera transmitted both into and out of the orbit, the ordinary nerves and the ophthalmic vein." "The orbital roofs were then removed, and disclosed the presence only of condensed cellular tissue, which, when cautiously dissected away, exposed the several small muscles which naturally belong to the organ of vision, supplied with their respective nerves."

Sir Benjamin Brodie truly says that the processes of nutrition, growth, &c., must be referred to the same class of functions as that of secretion generally. The following experiments prove, not only so much, but also the relative properties of the cerebro-spinal and ganglionic nerves. In a young cat, the terminations of the nerves of the eighth pair on the cardia of the stomach were carefully divided; the animal was perfectly well afterwards; was lively, ate its food as usual, and the respiration was not affected. At the end of a week, and three hours after having been fed with meat, the cat was killed. On dissection, digestion was found to be going on as usual; the food in the stomach was in a great measure dissolved; and the thoracic duct and the lacteals were distended with chyle, having the ordinary appearance. The nerves were carefully traced, and it was ascertained that not the smallest filament had been left undivided. This experiment was repeated with exactly the same results. It was long since asserted, "that the nerves of the par vagum are by no means necessary to digestion; and more recent experimenters, including Magendie and Dr. J. Reid, have arrived at a similar conclusion, provided their division is made in such a manner as not to affect respiration and the free oxygenation of the blood.

A portion of the anterior and posterior crural and sciatic nerves was removed in a dog in the upper part of the thigh: the limb, of course, became immediately benumbed and paralyzed. A wound was then made in the leg, and the claws of all the feet were cut so as to make them of the same length. The wounds suppurated and healed as readily as if the nerves had been entire. At the end of seven weeks I measured the claws of the four feet, and found that those on the paralyzed limb had grown equally with those of the other.

The experiment was repeated by Sir B. Brodie on guinea pigs, and with the same results. In one of them the tibia was broken, and the bone readily united.

The posterior part of the spinal marrow of a frog was removed so as to destroy the origin of the nerves of the lower extremities. In this case the bones of one leg were broken, and when the animal was killed the bones were found united, partly by callus and partly by bony substance. Experiments, very similar in their nature and effects, have been performed by Dr. Sharpey; and Muller says, by Shcroeder. I have also practically verified the position here taken—viz., that nutrition, growth, and reproduction, are equally the functions of the organic nervous system, both by experiments on living animals and by observing the recovery of the demented and paralyzed among the insane, from various kinds of bodily injuries (including fractures) and disease.

Whilst, however, Muller contends for the reciprocal dependence of the organs, and of the cerebro-spinal nerves, on each other for their existence he cautions his readers from concluding that the production of the former depends upon the pre-existence of the latter. He truly says, "both organs and nerves are produced by the same power, the *nisus formativus*, which resides undivided in the germ."—*Lancet, Sept.* 14, *p.* 314; *Sept.* 21, *p.* 339; *and Oct.* 26, 1850, *p.* 471.

15.—TREATMENT OF DELIRIUM AND COMA.

By Dr. R. B. Todd, F.R.S.

[We have already, in 'Retrospect,' Part XXI., referred to Dr. Todd's admirable Lectures on this subject before the College of Physicians. He dwells again on this interesting subject in his course of Lectures at King's College, with perhaps more particularity, and we are sure that we cannot too often bring his views before our professional friends. Dr. Todd commences by saying that from the great extent of the subject, he was unable to enter at length on the treatment of these diseases at the College of Physicians, and therefore proposes to discuss it more particularly under a separate head. Before speaking of the treatment, however, a few words with regard to the *diagnosis* are necessary, not only of each form of delirium or coma from the others, but especially of the inflammatory from the non-inflammatory forms of delirium and coma. Dr. Todd says:]

In this latter diagnosis, it is plain that we derive great aid from the clinical fact to which I have already alluded: namely, that the vast majority of cases of delirium and coma are clearly not dependent upon any inflammatory process in the brain—upon any process which leads to the formation of lymph or pus, or to the ultimate disorganization or total destruction of the tissues affected. And we derive further help, in the diagnosis, from the fact (which, I think, cannot be doubted), that inflammation of the brain (whether of the membranes or of the cerebral pulp) is a rare disease, excepting in quite young children. It is seldom met with, both in hospital and in private practice, excepting at those early periods of life when it is associated with a strumous state of constitution. Hence, there being the strongest reasons for concluding that inflammation of the brain is a rare disease, we are justified in holding the opinion that delirium and coma, in the vast majority of instances, are non-inflammatory affections, but that occasionally they depend upon, or are associated with, inflammation of the brain. What, now, are the symptoms which, in any given case, would lead us to affirm that the patient is suffering from inflammation of the brain? I shall enumerate these symptoms in the order of their frequency and importance.

The first symptom which I shall mention, because it is of very frequent occurrence, and ought to excite very strong apprehensions in the mind of the medical attendant, is *nausea* and *vomiting*. It comes without any assignable cause; sometimes the patient vomits without any previous warning, and quite irrespective of any food he may have taken into his stomach, or of any previous derangement of his digestive organs, or, indeed, of any previous marked disturbance of the general health.

Secondly, we meet with pain in the head as a very frequent symptom, which, however, exhibits a good deal of variety in its characters. Sometimes it is acute, and fixed in its situation; at other times dull and indefinite. It is more intense and better marked in proportion as the disease is seated nearer the surface. It is most intense in inflammation of the dura mater, less so in inflammation of the pia mater, and least severe in inflammation of the cerebral pulp. When the inflammation arises from a syphilitic taint, the dura mater is very frequently affected; and in such cases the pain in the head is not uncommonly accompanied by a tenderness of the pericranium in the position of the pain.

Thirdly, sluggishness of the pulse is a frequent accompaniment of even the most intense inflammation of the brain. The pulse may fall as low as 50, or even 40, or it may continue to beat at the rate of 60 or 70. It may be sluggish without being particularly slow. The artery strikes in a heavy sluggish manner, not rapidly or sharply, but conveying the sensation as if it impressed a larger surface of the finger than usual. Generally, however, in cases of inflammation of the brain the pulse is both slow and sluggish, and the heart's action heavy, the beats not succeeding each other rapidly.

Fourthly, we have delirium tending to coma. In inflammation of the brain the delirium is generally of the low and muttering kind. You seldom or never have wild frantic delirium when there is inflammation of the brain. The descriptions given by systematic authors of what is called *phrenitis*, appear to me to have no foundation in clinical study—at least, if that affection be regarded as a form of inflammation within the cranium. In inflammation of the brain there is, along with the delirium, a more or less comatose state, which gives to this form of delirium a close resemblance to that which comes on in typhus fever. Indeed, some cases of inflammation of the brain so much resemble typhus fever, that it is exceedingly difficult, or quite impossible, to distinguish between them, until the disease is so far advanced as to afford some special characteristic symptoms.

Fifthly, I may notice *coma*, which generally accompanies or follows delirium, and which is a more constant symptom of inflammation of the brain than delirium. Delirium of the low muttering kind, passing readily into coma, without any evidence of diseased kidney, or of impediment to the excretion of any other gland, affords strong presumptive evidence of the existence of inflammation of the brain.

The last symptom to which I shall refer as accompanying inflammation of the brain is *paralysis*, which occurs under a great variety of circumstances as regards degree and locality. Occurring in connection with the other symptoms I have detailed, it is a sure indication of the presence of destructive disease within the cranium. It is obvious, however, that it must vary considerably in extent, according to the extent and position of the inflammation. You may have a slight paralysis affecting the levator palpebræ and some of the muscles of the eye-ball; or a hemiplegia, perfect or otherwise, but frequently exhibiting a more or less contracted state of the muscles of the paralytic limbs.

The paralysed limbs are sometimes affected at intervals with epileptiform convulsions, more especially when the inflammatory process is seated on, or very near, the surface of the brain. In rare instances, in young subjects, such partial convulsive movements may pass into general convulsions: otherwise, I apprehend that general convulsions cannot be, regarded as a feature of the clinical history of inflammation of the brain.

Thus, then, that form of delirium which is accompanied with nausea or vomiting, pain in the head, or a slow sluggish pulse, and has an obvious tendency to the comatose state, or passes quickly into coma, and especially when accompanied or succeeded by paralysis, may be justly viewed as having its origin in inflammation with the cranium, more especially when there is no evidence of disease of the kidney.

Excluding the delirium which originates in inflammation of the brain, the diagnosis of the other forms of delirium from each other is comparatively simple, certain salient points in the history of each affording generally obvious indications of the nature of the delirium.

[Dr Todd considers the treatment of *delirium tremens* first, not only because we see it most frequently in hospital practice, but because the treatment best suited to it is also in a great degree applicable to other forms of delirium. He says:].

By delirium tremens I mean that state which comes on sooner or later in all persons addicted to habits of intemperance. Many practical men recognise two kinds of delirium tremens; but it would, as it seems to me, be more correct to consider these as two distinct forms of delirium closely allied, however, inasmuch as they both may arise from intemperance. The first is the true delirium tremens of drunkards,—*delirium ebrio-sorum*; the second is delirium from alcohol,—*delirium e potu*, which may occur in a man who is habitually the most temperate. As I go on you will see the importance of this distinction. The one occurs in a habitual drunkard,—the other may occur in a person drinking for the first time. One is frequently the precursor of the other. If a temperate man be led to drink excessively, the second form soon comes on, arising from the poison of alcohol interfering with the healthy action of the brain: but if he become a habitual drunkard, he is subject to attacks of the true delirium tremens, under particular circumstances. In this case, however, the poison is not alcohol, but a compound formed of alcohol and perhaps some morbid matter generated in the system. The true delirium tremens is the delirium of a man who, having long indulged in his cups, has by some means or other been depressed, or prevented from taking his accustomed amount of stimuli. The delirium e potu is the delirium of a man whose blood has become charged with alcohol; it is a case of active poisoning, the poison being alcohol: but we know this cannot be the case in the delirium of drunkards, because the exhibition of alcohol in some form or other is known by experience to constitute a most important part of the treatment of the disease; as if alcohol, within certain limits, were an antidote to the poison which disturbs the nutrition of the brain.

If these distinctions be correct, it is obviously of vast importance to recognise clearly the two maladies, as an essentially different treatment would be required. In the one case you have to deal with delirium supervening upon a disease in which the powers of life have been greatly impaired by a course of slow poisoning: in the other you have to oppose by your treatment the mischief done by the introduction of alcohol, and to eliminate this poison from the system.

You have very much the same difference in cases of opium-poisoning as in that of poisoning by alcohol. Habitual opium-eaters are liable to a form of delirium which closely resembles the true delirium tremens, and which like it, is apt to come on when they are deprived of their accustomed supply of opium. But the rapid administration of opium in large quantity will excite a state of delirium which very speedily passes into profound coma. In the one case, the administration of a certain quantity of opium, or of some other sedative, is essential to the cure: in the other case, the introduction of any more opium into the system would inevitably destroy the patient, or greatly increase his peril.

It is important to observe that these two kinds of delirium may be mixed: they may occur in the same patient at the same time. A man, habitually intemperate, whose blood is already poisoned by the peculiar poison of delirium tremens, and who has had the horrors, and many other of the symptoms of delirium tremens, sits down to a bout of drinking, and alcohol enters his blood in large quantity. Thus he becomes at once the subject of two states of which, however, the delirium e potu would evidently predominate. In such cases the treatment evidently becomes much complicated, and it would obviously be desirable to eliminate the free alcohol from the system before you can deal with the delirium tremens.

I shall now proceed to the consideration of the treatment of the true delirium tremens, which we meet with very commonly in hospital practice, both in a mild and in a more intense form.

I. The milder form of the disease is characterised by the occurence of horrors, hallucinations, tremor, vigilia. In such cases the patient fancies he sees demons, or dragons, or insects creeping over his bed, or flying in the air; he is suspicious, and thinks every body is combining against him to do him some injury; or he dreads some impending evil, and fancies himself about to die, or to fall into misfortune. With some or all of these symptoms there is more or less of tremor accompanying the voluntary motions. If you ask the patient to hold out his hand, he does so with a remarkable and characteristic tremor: this tremor interferes greatly with the due performance of many acts which require a nice muscular adjustment: he cannot hold and direct his pen properly: he is a long time about buttoning his coat or his breeches, or tying his cravat: to pick up a pin, or neatly insert it into any part of his garments, is quite beyond his power. So also if you make him shut his eyes strongly, or protrude his tongue, you witness the same characteristic tremulousness in those actions. He finds it difficult to obtain sleep, and if he does sleep it is only for short periods, frequently being waked up in a fright by horrible dreams, or with nightmare. With all these symptoms of disturbance of the nervous centres, the patient's skin is moist, often perspiring freely, his tongue is clean, and his pulse soft, and not quick.

In every case of this kind it is important to remember that the balance of nutrition, so to speak, is disturbed by some cause,—either by the want of proper food, from loss of appetite or from the inability to procure it, as we often find with our poor hospital patients; or by the impairment of the functions of the stomach, through the repeated use of stimulants, so that the patient is unable to retain or digest nutritious food. The great object of treatment, therefore, is, to restore the balance of nutrition and to procure sleep, in which, if you succeed, you cure your patient in a very few days. It generally happens in these mild cases that the discipline, the regular hours, and the care to which the patients are subjected in a hospital, restore them to health with very little medical interference.

[Dr. Todd illustrates the preceding observations by the particulars of the following case:

Henry Arden, aged 29, was admitted on the 2nd of July. His health had been good until nine months previously, when he suffered from some indisposition. He had acquired the habit of drinking porter daily, even to the amount of from four to five pints, from which he supposed he derived benefit.

Two months before his admission, he began to suffer from dyspeptic symptoms, with loss of appetite. He left off taking his porter, and, in his own words, "felt something rise from his chest to his head," accompanied by various hallucinations, (fancying himself to be walking about the house, opening the windows, &c.,) and these continuing, he was admitted on the 2nd of July. On admission, he exhibited all the characteristic signs of delirium tremens, tremors in all his movements, pallid countenance, sleeplessness, with the above hallucinations.

He was put simply upon a regulated diet, allowed a pint of porter daily, and a moderate quantity of meat, and ordered half a grain of morphia every night. On this night, he slept for the first time for four nights. On the fifth, the tremulousness was less, and all hallucinations had disappeared: and on the 12th, with the exception of some tremulousness remaining, he was quite well.

Dr. Todd then proceeds to consider the treatment of the more intense or confirmed delirium tremens.]

In deciding upon the appropriate treatment of such cases as these, we must look in the first instance to the immediate cause which has disturbed the balance of nutrition. We shall find this to be either that he has been deprived of food by dire want, or that his stomach has become so irritable that it rejects everything that he takes. I say it is important to determine the cause of this disturbed nutrition: because our first endeavor must be to induce our patient to take nourishing food. This will be easily enough effected if the patient had been deprived of food from necessity, or if his appetite had been impaired;—and it is best to administer the food in small quantities at a time, but frequently repeated. An ounce, or an ounce and a half, of mutton-chop may be given every two or three hours: or small quantities of some good animal broth or soup. The most difficult case to deal with is where the stomach has become extremely irritable, and rejects the food. Under such circumstances, the greatest nicety is required in the administration of nutriment. If the stomach will not bear solid food or animal broths, milk may be given, the caseine of which may serve for solid food: but it must be given in small quantities at a time, and it may be combined with lime-water, or sometimes even with very small quantities of some alcoholic stimulant—brandy, rum, and gin, it being generally better to select that stimulant which the patient has been accustomed to drink. The patient may be able to retain nourishment of this kind if given in tablespoonfuls or even teaspoonfuls at a time, while, if larger quantities were administered, vomiting would ensue.

At the same time, we may with advantage attempt to allay the irritability of the stomach, by other means likewise—as by giving ammonia in effervescence, or the common effervescing draught of soda or potash, or by prussic acid given with or without effervescing medicines; or we may have recourse to a very useful and effective remedy—kreosote combined with morphia, in small doses in the form of pills. Iced water, or small quantities of the pure Wenham Lake ice, will all allay the irritable stomach when other means fail.—Counter-irritation over the region of the stomach may be also employed with benefit—as mustard poultices, or flannels wrung out of hot water and sprinkled with turpentine.

The mucous membrane of the stomach is no doubt in these cases sometimes in a state of actual inflammation, or nearly approaching to it, although less frequently so than many suppose; and it may be desirable to apply leeches to the epigastrium: but as a general rule, it behoves us to be cautious about taking blood in these cases. I need scarcely add, that in all cases where the stomach is highly irritable it is very important to have the bowels freely evacuated, either by purgatives or by enema. Let us now suppose that your patient, not having slept for many hours, is in a state of delirium so violent that he cannot be kept in bed, and is with difficulty kept from injuring himself or others; how are we to act in such a case? There are three points to which your attention must be especially directed:—1. The due administration of nourishment. 2. The means of restraint. 3. How to procure sleep. I have already sufficiently considered the first point, and shall only add, that whatever the nature of the delirium, this point is primary and paramount.

[With regard to the second question of restraint, Dr. Todd says, although the patient should be prevented injuring himself and others, yet the straight waistcoat is to be avoided in every case if possible; although in one sense secure, it is a bad practice, and as you likewise want to procure sleep and to preserve strength, its use is almost incompatible with these objects.—The main objection to its use is that the patient is continually using the most forcible efforts to extricate himself from it. His mind is excited with the idea that he is held down by people sent to torment him, and he uses all his might to free himself from them; and hence it is Dr. Todd dwells upon the restraint being made chiefly by watching,—though there are some instances in which the straight waistcoat may be absolutely required. As to the third point, Dr. Todd remarks, there is no remedy to procure sleep better than crude opium or laudanum; and as these are known to contain all the active principles of the opium, the chances of obtaining the sedative and narcotic influence are greater with it than with morphia. Dr. Todd continues—]

When you give opium, do not be timid with it. Give a full dose at once, two or three grains, or a drachm of the tincture, and be guided by the progress of the case as to the frequency of its repetition and the amount of the subsequent doses.

The combination of camphor with opium frequently counteracts the unfavourable, and promotes the sedative influence of the latter. But I know no combination which, generally speaking, answers better in delirium tremens, especially where there is much depression, than that of quinine with opium. One or two grains of quinine, with from ten to thirty drops of laudanum, given every four, six, or eight hours, often answer extremely well.

Many practitioners, and amongst them some whose opinion is entitled to the greatest respect, have recommended a combination of tartar emetic and opium, and place great faith in this admixture; but I think a fallacy may exist here, in the fact that opium undoubtedly modifies and controls to a great extent the action of tartar emetic, so that in fact, whilst administering the two drugs, we may in truth be simply giving opium. If you could always succeed in limiting the influence of the tartar emetic to its simply alterative effects, there would be no objection to its use, as its action on the skin would materially assist in eliminating poisonous matters from the system, but its depressing influence does positive harm, and is not always so readily counteracted as is desirable. For this reason I seldom or never have recourse to this combination.

Another expedient which you should keep in view, as a means of quieting delirious patients, is the application of cold to the head, either by a bladder of ice or by the use of the cold douche. Both, you must remember, are powerful agents, and tend to produce depression of the heart's action, which may be carried to such an extent as to kill the patient, if the douche be applied too powerfully, or the ice be kept applied too long.

Sometimes, when we have persevered with opium for some time, the pupil becomes contracted, and yet the patient does not sleep. In such a case are we to persist in giving opium? I think a very contracted state of the pupils ought always to be taken by the practitioner as a strong indication against the further use of opium, and that then he may have recourse to other sedatives. Under such circumstances I incline to think we have a most valuable resource in the administration of chloroform by inhalation, but I have not as yet had sufficient experience of its effects to justify me in speaking very positively respecting it. I shall relate to you three cases, in which its use was followed by the most happy results.

The first case was that of a man in the hospital, who had been two days under treatment, and had taken plenty of nourishment and opium, and the pupils were so contracted that we were afraid to persist in the use of the latter. I ther-determined to try the inhalation of chloroform, and had it administered while I was in the ward, taking care to feel the pulse during its inhalation. The man was soon under its influence, and slept continuously for twenty-two hours, only waking once during this time to take nourishment. The report in the case-book states that this was the first sleep the patient had had for five days. He soon got quite well.

The second case likewise occurred in the hospital: opium, although not tried so long as in the first case, failed to produce sleep: chloroform was administered; the patient slept all that night, and the next morning was perfectly quiet, and soon went out restored to health.

A third case occurred in private practice, in a patient whom I saw with Mr. Simon. He had been treated in the most careful and judicious manner previously to my seeing him, and opium had been freely given without causing sleep, whilst it produced contracted pupils. It was now a question as to the propriety of administering chloroform, and I had no difficulty in agreeing with Mr. Simon to give it. It was accordingly done, although to effect it we had to use force: the patient slept soundly after it, and recovered very speedily.

[Dr. Todd now impresses certain cautions which it is very necessary to observe with reference to the use of chloroform. These are,]

1. That during its administration you must always keep your patient in the horizontal posture. 2. That, whilst the patient is inhaling, you should watch carefully the state of the pulse; and, if you should observe any marked alteration of an unfavourable kind in its strength or frequency, you should instantly desist from administering it. 3. That you should always examine the heart previously to the inhalation; and, if there be any decided disease of that organ, you should not admnister it at all. Chloroform is a very depressing agent, and it should therefore not be used without great carefulness on the part of the practitioner.

I may also add, that it is important, when possible, not to administer chloroform to a patient shortly after he has taken food, as under such circumstances the chloroform is very apt to excite an emetic effect, which would greatly embarrass the practitioner in his course of treatment.

There is a symptom, which patients affected with delirium tremens sometimes exhibit, much more difficult to combat than sleeplessness—namely, the obstinate refusal to take food. This is a most unfavorable symptom: and when it is present in a very marked manner, the prospect, both for the patient and practitioner, is most gloomy, because that first and most important indication in the treatment of the case—namely, the restoration of the balance of nutrition, cannot be fairly fulfilled.

In such a case we must devise some means of conveying nourishment into the system, either by persuasion or by force. One good plan is to give enemata of some highly nutritious broth, such as strong beef-tea. I frequently order a quarter, or half, or even a pint, of strong beef-tea, with ten or fifteen grains of quinine, regulating the quantity of the liquid by the probable facility with which the patient would retain the enema. Food may also be administered by the stomach-pump and œsophagus tube. For both these methods of giving nourishment force must be employed: less force will be required for the former than the latter, and therefore it is well to give a trial to the enema plan first. It will not do alone for any length of time, and therefore you will be obliged to have recourse to the œsophagus tube. The objection to the use of the stomach-pump and the œsophagus tube is, that in some cases great resistance is offered by the patient, and his struggles are apt to cause great exhaustion: and more than once I have seen unfavourable results follow this treatment: but in many cases you have no alternative.

In a few cases of this kind I have made the patient inhale chloroform, and, while he was under its influence, given food by introducing a spoon carefully into the mouth to the back of the throat, so as to excite the muscles of deglutition. The food conveyed to the back of the pharynx, within the grasp of the posterior pillars of the palate, produces reflex action of the constrictors, and is immediately swallowed. You must be careful, in giving food in this way, not to give a large quantity at once, as you thereby run the risk of making the patient sick.

An important question, as regards the general treatment of delirium tremens, is as to the propriety of bleeding. Is it necessary or desirable to bleed, either generally or locally, in such cases? Upon this point practical men are pretty well agreed, that bleeding is a bad and highly dangerous practice; and both reason and experience combine in support of this opinion. For in this delirium there is a marked tendency to the deterioration of the blood by increase of its water and a dimunition of its colouring matter; and we know that under a bleeding system this tendency becomes augmented, and so the disturbed nutrition of the brain increased and perpetuated. Moreover, there is nothing in the pathology of the disease which would warrant us in blood-letting: for we have it ascertained on the most incontestable evidence that there is no inflammation or congestion to combat by such means. Again, experience shows that bleeding is followed by unsatisfactory results. If you bleed in violent delirium, you generally add fuel to the fire, and you increase the violence of the delirium: unless, indeed, you take away so much blood as to produce extreme prostration which destroys the force of the patient, and from which he is not likely to rally.

In fine, in the treatment of the ordinary cases of delirium tremens which you will meet with in practice, I cannot too strongly impress it upon you, that the most important point is to uphold the strength of the patient, in which, unless you can succeed, all other remedies will be useless. In confirmation of this, I may here mention, that Dr. Gerrardt, of Philadelphia, as I learn from Dr. Wood's excellent book on the practice of physic, pursues with great success a purely stimulating plan of treatment in delirium tremens, to which alone he trusts; he gives in all cases, an ounce or two ounces of brandy, every two, three, or four hours, according to circumstances; and by following this plan he has reduced the mortality from this disease in the large hospital at Philadelphia, from one in eight, to one in thirty-nine. This is a very important statistical fact in reference to the treatment of delirium tremens, and affords valuable support to the advice I have given you. I am not, however, prepared to trust to this treatment alone, nor to give up the use of opium and of other remedies.

In some cases of delirium tremens there is a decided tendency to a comatose state, which you must be prepared to deal with. In such cases, the rule to uphold the powers of the patient as much as possible applies equally with the others; but it is plain that you will have to give up the use of opium and all other sedatives, as tending to increase the coma.

Delirium e potu.—Let me now speak of the treatment of cases suffering from the *delirium e potu*, a state which, we have seen, is in many respects essentially different from that of the true delirium tremens. A patient is brought into the hospital in a state of violent delirium, talkative, perhaps singing or hollowing, and requiring considerable restraint to hold him down; and we find, on inquiring, that he has been drinking; and we have evidence of that in the odour of alcohol from his breath. The long continuance of this state leads to coma. Now in these cases, which are examples of direct poisoning by alcohol, the great object of the treatment is to promote the elimination of the poison without unduly depressing the vital powers. This may best be done by emetics, purgatives, and sudorifics. You would give emetics, if you had reason to believe that there was alcohol still in the stomach, or indigested food. Nauseating doses of tartar emetic are useful in reducing the force of the heart's action, and in promoting free diaphoresis. It must be in cases of this kind, and not in those of true delirium tremens, that croton oil has been, as I have heard, used with great success by some practitioners in the country; I have no experience of it myself. It may be that such a practice would tell well in the mixed cases.

A sudden splash upon the head, and face, and chest, with a large quantity of cold water often exercises a decidedly sedative influence; but if this fails, you need not have the same difficulty about using mechanical restraint in this as in the cases of true delirium tremens; and then you will find it useful to keep cold well applied to the head.

In these cases local bleeding may be sometimes practised with advantage;

but it should always be tried with caution, and you should bear in mind that the poison of alcohol is apt, when given largely and quickly, to leave behind it a state of depression, which bleeding is apt to increase. In many of these cases there is a highly irritable state of stomach, due to a state of mucous membrane which is probably inflammatory, and brought on by the direct influence of the alcohol. When this is the case, of course you will not give such remedies as tartar emetic, but you will direct your treatment to the irritable state of the stomach. Counter-irritation by mustard to the epigastrium; ice or iced water in small and frequently repeated quantities: cold drinks; prussic acid,—will very generally succeed. If these means fail, then try leeching the epigastrium, morphia and creosote, effervescing draughts with potash, soda, or ammonia; and it is very important to keep up a free action of the bowels, which may best be done by small and often repeated doses of sulphate of magnesia, dissolved in water, which of themselves tend to relieve the irritable state of the stomach.

In cases where the true delirium tremens is complicated with the delirium e potu coming on after a debauch, we must endeavor to restore the balance of nutrition in order to cure the delirium tremens, and also apply the proper remedies to relieve the delirium e potu: we must, in fact, combine, as far as possible, the two forms of treatment.

[In all cases of delirium connected with pneumonia, Dr. Todd advises the stimulating plan of treatment, and in illustration of this subject, he relates two cases of pneumonia in which this symptom occurred, which were thus successfully treated; and although the delirium in the second case did not go beyond a slight wandering at night, yet he attributes the almost total absence of it to the fact that the stimulants were early and freely administered. Passing on to the delirium of bronchitis, Dr. Todd continues:]

The delirium of bronchitis should be dealt with in every way as the delirium of pneumonia. Depression of the vital powers favors the occurrence of delirium; and bronchitis is, generally speaking, a very depressing disease. If therefore, you should be attempting to cut short the inflammation in a case of bronchitis by active antiphlogistic treatment, you may look upon the occurrence of delirium as the signal for you to alter your treatment and to adopt a stimulating plan. There is a great tendency in the delirium of bronchitis and of pneumonia to pass into coma; and, unless prompt means are adopted by the physician, the patient dies. This tendency to coma is certainly greater when antiphlogistic remedies have been used. When coma comes on, you must not relax in giving support; indeed the failure of the pulse or of the heart's action may induce you to be more active in the administration of stimulants: but, in addition to this, you will probably find great benefit from free counter-irritation, by mustard or blister, or both, to the back of the neck; and it may be necessary to shave the head, and apply a blister to the scalp.

Sometimes but very rarely, the coma coming on sudddenly in this way may arise from a sudden effusion of blood upon or into the brain.

Rheumatic and gouty delirium.—I shall now proceed to speak of the treatment of the rheumatic and gouty forms of delirium.

Rheumatic delirium generally comes on suddenly in the course of rheumatic fever, and is frequently *coincident* with pericarditis and endocarditis. I say it is *coincident* with the cardiac affection, and not necessarily related to it as effect to cause; because the amount of severity of the delirium bears no proportion to the intensity of the inflammation; for we may have slight peri- or endocarditis with severe delirium, or we may have slight delirium with extensive inflammation of the heart; and we know well that the cardiac inflammation often exists without the delirium. The severity of the delirium is, however, in proportion to the debility of the patient. When you have a very watery state of the blood, or where the blood is deficient in colouring matter, and when, also, perhaps, the blood is much charged with the rheumatic poison, you have a condition highly favourable to the production of delirium.

The rheumatic delirium undoubtedly occurs more frequently in those cases of rheumatic fever which have been treated by bleeding; and probably because bleeding makes the blood watery, and diminishes its red particles. When I was in the habit of bleeding in every case of rheumatic fever, as I used to do some years ago, a much larger portion of my patients were attacked with delirium than now, when I never bleed in this disease: indeed, now I find it difficult to meet with a case of this form of delirium to show you.

Now let us suppose that you are asked to see a patient who had been labouring under rheumatic fever, and who has suddenly become delirious, with or without difficulty of breathing. From what you now know of the clinical history of the disease, you would at once examine the state of the heart, whether there were any symptoms referable to that organ or not. Let us suppose that you find, as in the majority of cases you will do, a rubbing sound, showing the existence of the pericarditis, or a bellows sound, indicative of valvular disease or of extreme anæmia. What are you to do in such a case as this? The patient is quite delirious, tosses about the bed-clothes, talks wildly, tries to get out of bed, and will not be restrained.

Although there is inflammation of the heart here, and none of the brain, yet I can assure you that the symptom which demands most urgently your first attention is the delirium; and that whatever may be your theory as to the relation of the delirium to the affection of the heart, the interests of your patient demand the instant adoption of means to quiet the state of excitement into which he has passed. Important and serious as is the affection of the heart, as compared with the delirium, it is just now of no moment; for if the delirium be allowed to continue, there is great danger of the patient dying suddenly from exhaustion.

Fortunately, however, we have in opium a remedy equally applicable to the cardiac, as well as to the cerebral affection. In these cases you must give opium to produce sleep, just as you would do in traumatic delirium or in delirium tremens. Opium thus given will quiet not only the brain, but the heart also; and it no doubt exercises a favourable influence on the inflamed serous membrane likewise, checking the spread of inflammation and promoting its resolution.

At the same time you will find it useful to apply a blister to the region of the heart, and to promote a free discharge from the blistered surface. But avoid bleeding, whether general or topical, if you wish to get your patient through without untoward symptoms, and reserve all other depressing treatment until the symptoms of delirium have passed away. During delirium you must also be careful to administer support, because the very existence of delirium makes great calls on the powers of the patient, and he therefore requires to be freely supplied with nutritious matter easy of digestion, and with stimulants. You need not be deterred from giving opium, and administering support and stimulants, by the fear lest such treatment should increase the cardiac inflammation; the experience of many cases convinces me that under this plan the heart becomes less irritable, the pulse slower, and the cardiac inflammation becomes circumscribed, and it tends to terminate by resolution or adhesion rather than by the effusion of water. On the other hand, if you persist in an antiphlogistic plan, you keep up or increase delirium, you exhaust the powers of the patient, and effusion is apt to take place into the pericardium, whereby the heart's action may become seriously impeded.

If this treatment be commenced early, and pursued effectually, it is rare indeed for the patient to go wrong.

[Little need be said on the delirium accompanying acute gout, as the remarks upon the rheumatic form apply also to it; but as it has a peculiar tendency to pass into coma, we must not be so ready to administer opium as in the rheumatic affection, but wait and observe if there is any marked tendency to coma.]

The delirium of erysipelas.—The next subject to which I shall call your attention is the mode of treating the delirium of erysipelas. I know no disease the pathology and treatment of which are more worthy of the careful consideration of the practical physician or surgeon than erysipelas, as it is a malady of very frequent occurrence, and very severe and destructive in its nature. The question of the treatment of the delirium of erysipelas involves the consideration of the treatment of erysipelas itself. I refer here of course particularly to the idiopathic erysipelas, which comes under the observation of the physician; but the remarks I have to make will apply equally to the phlegmonous form which you will meet with in the surgical wards, for the two forms of the disease are of essentially the same nature.

Let me begin by stating what appears to me to be the most reasonable view of the nature of erysipelas, and the most consonant with its clinical history. Erysipelas is produced by the introduction into the system of a morbid poison, generated in the body under certain circumstances, or derived from another individual affected with the disease. A patient who has received an injury may generate the poison of erysipelas in his own person by exposure to certain deleterious influences; or he may, under similar circumstances, generate this poison in his own body, even when he has not received any wound, in which case we call the erysipelas *idiopathic*. Or whether wounded or not, he may imbibe the poison from some one laboring under the disease, even without actual contact.

The poison of erysipelas, like that of measles, of small-pox, of scarlet fever, &c., has its special habitat,—that is, it shows a proneness to affect certain tissues to the exclusion of others: and it attacks specially the skin and the gastro-pulmonary mucous membrane, sometimes affecting the throat first, and traveling outward to the skin; at other times taking the contrary course. This poison produces other effects than mere cutaneous inflammation; its introduction into the blood causes a fever of a very depressing nature, and this amount of depression bears no constant relation to the extent of the cutaneous inflammation. A large dose of this poison may kill a patient in a few hours, causing at the same time only very trifling local disturbance, such as a trifling redness of the throat. Generally speaking, however, it requires many days for its elimination, during which time the patient exhibits the local and constitutional symptoms with which you are familiar.

Like the other morbid poisons to which I have alluded, the poison of erysipelas exhibits secondary and tertiary effects: secondary effects in the formation of abscesses in various parts of the body, and even in parts which may not have been affected by the cutaneous inflammation and induration of various glands, and the deposition of scrofulous matter.

What is the most reasonable and the best treatment of erysipelas? have we any means of eradicating the poison by a bold stroke at the onset of the disease? Slight cases,—or, in other words, cases which have imbibed only a small dose of the poison—will quickly recover, with little or no medical treatment; and such cases, when treated early by a bold antiphlogistic measure, will appear to have been cut short. But, in the majority of cases, when a large dose of the poison has been imbibed, I believe that the disease must pass through a certain course, that the poison will produce its specific effects, and that the principal business of the practitioner is to uphold the powers of the patient so as to limit as much as possible the destructive influence of the poison. In such a case you can no more think of extracting the poison by some active stroke of treatment, than you can think of eradicating the poison of small-pox or scarlet fever under similar circumstances. Any one who would, now-a-days, think of such a thing in these maladies, would be set down as having lost his senses. We have no means of extracting the poison: we must, therefore, endeavour to guide our patient through the various stages of the fever it excites, into port, or we must find some antidote for it, which, when introduced into the blood, may counteract its depressing and destructive effects.

There is no treatment which appears to me to be so generally applicable and so safe in cases of erysipelas, as that which we call the stimulating treatment—by support by means of nutritious food in the liquid form, and by bark, or ammonia, or chloric ether; nor is there anything which seems, in some cases most strikingly, to act so much as an antidote to the erysipelatous poison, as alcohol given either as brandy or wine, or beer, but more especially as the first.

In all cases of erysipelas, then, my practice is first to evacuate the bowels, when necessary, by such means as will not occasion any undue depression, and then to give nutritious food, easily digestible, with stimulants, as brandy or wine. I adjust the quantity of these according to the urgency of the symptoms, keeping, however, to this rule—namely, to give small quantities very frequently, and at short intervals, rather than larger quantities administered occasionally. This is, if I may use the expression, the staple of my treatment: to it I add such medicines as ammonia, bark, &c.; but if the stomach be irritable, or the patient opposes or is disgusted with the administration of so many things, I prefer giving up the drugs and trusting to food and brandy only.

Patients treated in this way from the beginning do not often become violently delirious. When delirium sets in in erysipelas, it may be taken as an indication that our patient wants more support and more stimulus; and the more quickly and freely you give them under such circumstances, the sooner you will subdue the delirium. If freely given just at the beginning of the delirium, you may check it completely. Of this I had a remarkable example last summer, in the case of a clergyman, a robust man, who came to town with his family to see the lions. He caught cold, as he thought, from sitting one hot day, with a north-east wind, near an open window in an omnibus. That evening he had a severe rigor, and vomited. I saw him soon after, and found some redness of the mucous membrane of the nose, spreading outwards on the skin. I immediately suspected erysipelas, and the next day confirmed my suspicions, as the redness had extended over the nose. He was moderately purged, and to his surprise I allowed him two or three glasses of port wine at once. Under this treatment he seemed to go on well for a couple of days. One night I was led almost by accident to visit him at a very late hour: and to my surprise he was looking strange, talking rather wildly, and wanting to get up and go out. I immediately called for the brandy bottle, and gave him a large dose of it, which seemed to quiet him; and I left instructions with the nurse to give him smaller quantities at short intervals through the night. Next morning I found that he had slept through the greater part of the night, and that the delirium had completely ceased.

In cases which show a tendency to coma, it is often advisable to shave the head and apply blisters freely to the scalp or back of the neck. Nor need you be deterred from applying blisters, by the fear lest the blistered surface should become the seat of new erysipelas. As a rule, it is not desirable to give opium in the delirium of erysipelas, unless the delirium is decidedly of the active and wakeful kind; on the whole, however, the other narcotics, as henbane, camphor, hop, are safer than opium.

The stimulating treatment in erysipelas not only saves the patient from delirium, or cuts it short when it appears, but it shortens the period of convalescence, and, what is very important, it seems to diminish the tendency to secondary deposits. We have had many cases in the hospital which exemplify this remark. You may recollect a very severe case of erysipelas last winter in Lonsdale ward: the patient was quite delirious, and there was afterwards a tendency to coma; nevertheless, this patient quickly recovered, and had no secondary abscesses; she was treated by stimulants from the beginning. In Augusta ward, also, we had a similar case about the same time, which was treated in the same way with a like result. The clergyman's case, to which I just now alluded, afforded another example of the absence of secondary deposits under stimulating treatment, although the erysipelas extended over the whole scalp. His wife, on the other hand, who caught the disease from him, had a very irritable stomach, and could not take stimulants; and she had an abscess in one of the upper eyelids. In the case of a young lady whom I attended in the spring, along with Mr. Bowman, with severe erysipelas, there was no secondary abscesses; she was treated by brandy and nourishment from the beginning; and I could enumerate several other instances in which this desirable result followed the stimulating treatment.

Now and then it will happen that an erysipelatous patient will rapidly become comatose, and die in spite of all our remedies. There was a man in Sutherland ward a short time ago, affected with erysipelas, who appeared going on very well for some time, but suddenly he became comatose, and died, and we could not make out any reason for his death. The only reasonable explanation that I can offer of the sudden change for the worse which sometimes occurs in these cases, is derived from the well-known tendency they have to form pus, which, accumulating at some point, may find its way through the ulcerated coats of some small vein, and thus enter the circulation, producing coma and complete prostration.

[Dr. Todd declines entering into any discussion as to the treatment of delirium in scarlet fever and measles, as it is in all essential points the same as that of erysipelas, and requires the same guidance in its management.]

I now proceed to consider the treatment of the delirium of typhus fever. In all low forms of fever delirium frequently manifests itself; and this is particularly the case in the course of typhus fever, and of typhoid fever also, if you choose to adopt the opinion of those who admit the existence of two distinct forms of disease: the one a fever of low type, characterized by a tendency to ulceration of Peyer's glands and diarrhœa—*the typhoid fever;* the other, *the true typhus*, a contagious disease, with brown tongue, great prostration, and without the tendency to diarrhœa. This is not the time to discuss the question whether two such distinct forms of fever really do exist. I must content myself with using the term typhoid delirium generically; for in both states of fever we meet with delirium of the same character, which requires the same kind of treatment, but we notice it under the two following forms:—

1st. Delirium of the low and muttering kind, in which the patient lies on his back, constantly muttering to himself, apparently unconscious of what is going on around him, but capable of being roused by loud speaking.

2dly. Delirium of the active kind, in which the patient is very restless, wakeful, talkative, wanting to get up, and requiring careful watching, and perhaps restraint.

When the delirium is of the active and wakeful kind, it generally comes on quite suddenly; but the low form of delirium, which is the most common, come on very gradually, being first noticed perhaps at night as a slight wandering, then the next night becoming more marked in its characters, and afterwards continuing through both day and night.

Now delirium in fever, of whatever kind it be, is a very serious symptom, and demands the closest attention from the practitioner. Its occurrence generally denotes great depression of the vital powers, and it is of itself calculated to increase exhaustion, especially if the delirium be of the active kind.

In considering the treatment of the delirium of typhus, we shall do well to look a little into the nature of typhus fever itself, as in a former lecture I referred to the chief points in the nature of erysipelas while discussing the treatment of the delirium which accompanies that disease. Typhus fever, then, may be said to arise from the introduction into the system of a special morbid poison, capable of being generated in the human body, and of being communicated from one person to another, although possibly this may not be the only way in which the poison may be propagated. The severity of the symptoms produced by the imbibition of the poison varies much in different cases, depending upon the dose of the poison which has been imbibed, and perhaps, also, upon the condition of the patient at the time of the imbibition, and likewise upon the nature of the poison itself; for doubtless this may vary at different times, and so give rise to that variety in the nature of different epidemics to which most practical men bear testimony.

The morbid poison is eliminated from the system through certain channels, as the skin and mucous membranes; but, like the poison of erysipelas, scarlatina, and many others, it exerts an influence on the condition of the system, which is generally of a very depressing kind, and this continues until the poison is eliminated, or its influence exhausted by some change which it may undergo in the blood.

This seems to be the view of the nature of typhus fever which is most consonant with reason and experience. If it be true, we can scarcely expect that any means we can devise will cut short the fever, or rapidly eliminate the poison from the system. We must deal with the disease as we would with erysipelas, scarlet-fever, small-pox, and support our patient while the fever runs its course, guarding him as much as we can against the destructive influence of the poison. And as this poison is apt to cause great depression, the chief business of the practitioner will be to devise the best means of opposing this depressing influence. This may be best done by giving food, of a nutritious kind, in such a way as may be most easily digested, and will occasion the least irritation of the digestive organs. It will generally be found necessary to administer stimulants, and I think that it is unwise to postpone this part of the treatment long; on the contrary, I prefer giving stimulants *early*, as, by so doing, the necessity for giving them largely is generally avoided. Throughout the whole course of the fever, the greatest pains should be taken to husband the strength of the patient by good nursing, and by instant attention to every want. He should never be suffered to do anything for himself, nor allowed to get out of bed; he must be raised or turned in bed when necessary, and he must be fed as you would an infant. Too much importance cannot be attached to these apparently trivial matters in the management of so serious a malady as typhus fever. Many a patient has lost his life for want of these necessary attentions—either from the culpable neglect of them on the part of attendants and nurses, or from his inability to obtain them.

If the bowels are confined we should give a purgative which will act very mildly, or they should be opened by enema: and, in giving medicine for the bowels, we should never lose sight of the danger there is in all these cases of the supervention of a troublesome and debilitating diarrhœa. It never can be necessary in typhus fever to purge, or to do more than keep the bowels in such an open state as will assist digestion.

In consequence of the liability of Peyer's glands to be affected with ulceration, strong purgatives may do great mischief, by increasing the inflammation, and perhaps exciting ulceration, which may end in perforation of the intestine, and fatal peritonitis. On the other hand, it is very necessary to provide for the due evacuation of the intestinal canal, not only to promote the digestive powers and the due absorption of the food, but also because, if the secretions are allowed to remain in the bowels, they will themselves excite irritation, and interfere with the due elimination of the poison.

All men of experience agree that it is right and necessary to uphold the strength in typhus fever, but differ as to the best mode of effecting this object. Some only give nutritious food, others think it necessary to combine stimulants with it. My own experience has led me to the conclusion that stimulants are necessary in the vast majority of cases. I have never seen any ill effects arise from the early administration of stimulants: and, on the other hand, I have often had occasion to regret that the use of them had been too long delayed. Moreover, this fact weighs much with me in inducing me to give stimulants early—namely, that if a patient seem over-stimulated, nothing is easier than to pull him down, and that pretty quickly: but if he be sufficiently supported and stimulated, it is often of extreme difficulty to build him up: *hic labor, hoc opus est.* And with reference to the administration of stimulants, I have only to repeat the rules which I gave you on former occasions. Do not give large quantities at a time: do not embarrass the patient, but begin with small quantities frequently repeated. Give wine first, and then, if necessary, change to brandy, or some other spirit. Chloric æther is one of the best medicinal stimulants; it may be given in half-drachm doses every three or four hours, or more frequently if necessary, alone, or in combination with five or six grains of carbonate of ammonia.

Such is a brief outline of the general plan of treatment to be pursued in typhus fever. If, now, we find that delirium sets in in the course of the fever, what is to be done? Ought this to lead us to alter in any way our mode of treatment, and to adopt new and different measures? Whatever be the nature of the delirium, we must, I think, deal with it as part and parcel of the fever, and view it as an indication of a more depressed state of the system calling for an increased amount of stimulants, or a change in the nature of them, and for greater diligence in the administration of nutritious food.

Is there any necessity for local treatment directed to the head when delirium comes on in the course of typhus fever? Nothing is more certain than that there is no inflammation of the brain in typhus fever, not even when delirium occurs: there is, therefore, no need for active local measures on this account.

Some years ago, a theory was put forward by a distinguished physician of this town which ascribed typhus fever to inflammation of the brain: and this gained some support from the fact. that inflammation of the brain frequently takes on the characters of typhus fever, as was the case in a patient whose history I related to you in a former lecture. But the experience of nearly all practical men in all countries tends to show that there is no connection between typhus fever and inflammation of the brain.

You will say, however, that though there is no inflammation there may be congestion. Undoubtedly this is the case; but the congestion is not peculiar to the brain: it is only part of a general congestion which affects the capillary system of the whole body, and is probably due to the presence of the typhus poison in the blood, which weakens the forces by which the blood is moved in that system of vessels. To relieve this congestion, therefore ought we to resort to local depletion? Upon this point you must be guided by the circumstances of each particular case. bearing in mind that in so enfeebled a state of the capillary circulation the mere taking away of blood is seldom of much use. What is most needed under these circumstances is something to stimulate the capillary circulation, so as to promote the flow of the blood, which tends to stagnate in the fine blood-vessels. Now for this purpose the application of blisters to the shaven scalp is most useful; and you will often find it a better plan to apply several small blisters to different parts of the scalp in succession, than to apply one large one. Sometimes, however, you will not have time to wait for this process: the patient has a strong tendency to coma, or is actively delirious, and at the same time his strength is rapidly on the wane. When this is the case you must apply one large blister all over the scalp; and you will find Dr. Corrigan's plan a very good one—namely, to cut the blister plaster in strips. and to lay them over the scalp as you would strap a man's leg. so as to bring the blistering material into contact with the scalp at every point.

If you should see any clear reasons for taking away blood, you may best gain your object by having it done by expert cupping from the temples. The rapid application of the well-exhausted cupping-glass may act as a stimulus to the capillary circulation, and promote the flow of blood through it.

When the delirium is of the restless and wakeful form, are we to give opium? As a general rule, we must be extremely cautious in the use of opium in typhus fever. We know that opium tends to produce the same effects as the typhoid poison—namely, to favor capillary congestion; therefore. by giving opium, we should only aggravate one of the great evils of the typhoid state. There is another reason why opium should not be administered in fever—namely that it tends to clog up the secretions, and so to prevent the elimination of the morbid poison, which is an object we are desirous of promoting. Nevertheless, when the state of congestion is not obvious, and the powers of the patient are not very low. I have seen the very best effects derived from the administration of one or two doses of opium well timed.

You will often find it necessary and most useful to give opium by enema in those cases of diarrhœa which often occur in typhus, or, if you will, in typhoid fever. This is a practice which I always follow, and with the best results, never to allow the diarrhœa to get ahead, but to keep it down by the frequent administration of small enemata of starch, sometimes, if the diarrhœa be urgent, repeated twice or thrice a day, with five, ten, or twenty minims of the tincture of opium. Dr. Corrigan, who has had great experience in the treatment of fever in Dublin, states that the application of not more than two or three leeches to the temple is often of great benefit in promoting sleep; and he was first led to adopt this practice by observing that spontaneous hemorrhage from the nose was followed by sleep in some cases. Dr. Graves lays great stress upon the advantages of combining tartar emetic with opium; he says that the antimony prevents the too narcotic effects of the opium, whilst the junction of opium with antimony promotes the sedative influence of the latter, and guards the system against its depressing power.

Are we to be deterred by the occurrence of delirium from the continued use of stimulants? The mere occurrence of delirium need not deter you from the continued use of stimulants; on the contrary, in some cases it should incite you to give them more freely, in larger and more frequent doses. But in all cases their influence upon the pulse will serve you as a useful guide: and if you find that under stimulants the pulse does not quicken, but improves in quality, and more especially if it diminishes in frequency, you may continue the use of stimulants.

[Dr. Todd now speaks of epileptic delirium. It is met with in persons who may or may not have had fits previously, or it may come on before or after the fits, and may, no doubt, be mistaken for, and confounded with, acute mania and phrenitis. It is highly important that it should be truly diagnosed, both by negative and positive evidence. The history and absence of certain obvious phenomena, will denote that it is neither erysipelatous, typhoid, pneumoniac, *nor* rheumatic; and the absence of certain other symptoms, as pain in the head, sickness, sluggish pulse, and non-existence of the tendency to coma, will show that there is no inflammation of the brain or its membranes. Besides which, we must ascertain that it is not delirium tremens, or connected with hysteria. If it cannot be referred to any of these, it is most probable it will be epileptic, and we must then look for the various positive signs to prove it.]

The paroxysm of delirium may be looked upon as a prolonged epileptic fit. It is a fit in which the disturbance of cerebral nutrition is mainly limited to the convolutions of the brain. In the ordinary convulsive fit, the parts of the brain which are affected are probably the tubercula quadrigemina and the hemispheres; in the delirious fit, *without convulsions*, the latter parts alone are affected. In some of the milder cases of epileptic disease we see this isolation of the mental affection and of the convulsive very conspicuously. Thus we observe in some cases that the paroxysm consists only in a momentary loss of consciousness, from which the patient instantaneously recovers: while in others it consists of sudden convulsive starts, affecting the upper or lower extremities, or both, and which, when the latter are affected, are sometimes so severe as to throw the patient down. Yet in many of these the patient retains his consciousness perfectly undisturbed. You have examples of both of these states now in the hospital; one in Sutherland ward, in the man whose skin was darkened by a course of nitrate of silver, which he took before his admission. This man has the smaller fits of loss of consciousness, momentary faintings, of which he will sometimes have several in the course of the day. The other case is a lad of Jewish parents, who has the convulsive startings to a very great extent, sometimes fifteen or twenty times a day, and frequently with great violence: but he assures us that never, in even the most severe of them, by which he is thrown down with violence, does he lose his consciousness. This lad, however, has also the regular and fully developed fits, but not more frequently than once in three or four weeks.

It is not, then, unreasonable to suppose that if you may have a short and very temporary affection of the intellect and consciousness, you may also have a prolonged affection of them, constituting the epileptic delirium, which may be ushered in by a regular fit, or which may be determined by a regular fit.

Now I apprehend that no one, now-a-days, will pretend that we have as yet discovered any mode of cutting short the ordinary epileptic convulsive paroxysm. Many means for this purpose have been proposed; such as putting salt in the mouth, pressure on the carotids, bleeding, splashing with cold water, but none have been followed with any degree of success which justifies us in adopting them. I do not say that you may not, if you fancy, try the more harmless of them such as the salt and the cold water; but anything which interferes with the circulation is dangerous, and must not be tried on light grounds.

I do not believe, then, (to answer the question which I just now proposed), that we have any sovereign means of cutting short the paroxysm of epileptic delirium; and therefore, I regret to say, that very much of the advice I have to give you on the management of these cases must consist of cautions to you as to what you ought not to do, rather than of positive instructions as to what you must do.

We have, in fact, in the treatment of a case of this kind, to guide our patient through a prolonged epileptic fit; to support his powers until the excitement of the paroxysm passes off, and to guard him against injury. Time is the great element in his cure, and the clinical history of similar cases gives us the best assurance that the paroxysm will in time, if we do not allow the patient's strength to be exhausted, exhaust itself. Our treatment, then, must be mainly *supporting* and *expectant*, with due attention to the ordinary functions of the digestive organs.

And now I must tell you what you ought not to do.

In the first place, as we have the most satisfactory evidence that there is no inflammation of the brain in these cases, you need not harass your patient by the employment of antiphlogistic remedies. You must not bleed him: there is no necessity nor demand for this practice; it often increases the violence and the duration of the ordinary epileptic paroxysm, and it also tends to increase and prolong the delirium, as it does in other forms of delirium. Neither is it advisable to bleed locally, either by leeches or cupping—or, if you think it prudent to yield to the solicitations of friends, take care to be very sparing in the quantity of blood you take away. When the pulse is strong and slow, stimulants are not required, your patient will be better without them: but when the pulse is weak, vacillating, irregular, and more especially when it is quick and running, then stimulants carefully given will prove advantageous. You may shave the head; and if it be hot, apply cold applications, but in such a way as not to depress the heart's action. This will give the patient and his attendants something to do, and enable you to proceed the more comfortably with your expectant plan. You may likewise apply small blisters in succession to the scalp, but do so without irritating the patient much, and desist immediately if it seem to have that effect. The moral treatment is particularly to be noticed here, as in many cases it proves of great benefit: all causes of excitement should be carefully avoided. As to restraint, you must exercise the rules I mentioned in speaking of delirium tremens. All means must be taken to prevent the patient from injuring himself; but the gentler the means employed (provided they be effectual) the better. Upon this point I should be glad, if I had time, to read to you some extracts from Dr. Conolly's valuable lectures on the treatment of acute mania, published in the 'Lancet;' but I advise you to peruse them for yourselves—to read, mark, learn, and inwardly digest, the wise and humane cautions there given as to the management of these cases.

Sometimes there is extreme wakefulness, and you cannot get the patient to sleep. What are you to do? Avoid opium, generally speaking: if you give a sedative at all, let it be hyosciamus or hop. Sometimes the cold douche or the shower-bath prove very effectual in inducing sleep. The head may be placed out of bed, and cold water poured upon it from a height, or it may be very freely sluiced with a large sponge. I have seen chloroform of great use where opium had utterly failed: but you must bear in mind the same precautions with regard to its use as to the use of opium; do not give it if you can do without it. Any other drugs which you administer should be of the tonic kind, of which the most useful are the metallic tonics, as zinc and iron, or you may give bark or quinine.

[In speaking of the general treatment of coma, Dr. Todd excludes the apoplectic coma; that is, by effused blood; or, indeed, pressure produced in any other manner upon the brain. And, therefore, in dealing with any particular case we must first satisfy ourselves that it is not coma from pressure, or from inflammation of the brain.]

In investigating cases of coma you must be careful to enquire into the state of the renal and hepatic secretions. When either the liver or the kidneys fail, the patient becomes comatose. The liver may fail either from actual non-elimination,—the elements of the bile remaining in the blood, the liver having lost its power of attracting them out of it,—or there may be some mechanical impediment to the flow of the bile, either in disease of the ducts themselves within the liver, or in some stoppage of the hepatic or common ducts outside the liver. The hepatic derangement shows itself plainly enough in the jaundiced state of the patient. When the kidney is at fault I need not tell you that you will find the evidence of it in a careful chemical microscopical investigation of the urine.

The former history of the patient affords the most valuable and important guidance in the diagnosis of the various forms of comatose affections. You must inquire into the state of the patient previous to the occurrence of the coma, and must consider whether he has been the subject of epilepsy, gout, rheumatism, hysteria, or renal disease, as the coma may arise from any of these conditions. You should also inquire into the previous habits of your patient, as to intemperance, taking opium, &c., as coma may arise from the presence of opium or of alcohol in the system. You must, then, before you fix upon your line of treatment, be satisfied that the coma is not apoplectic,—that is, from pressure; and also that it is not due to the presence of opium or of alcohol in the system. Excluding these, the coma may be traumatic, from shock, producing simple concussion of the brain, or it may be epileptic, or renal epileptic, or hysterical, or rheumatic, or gouty. I shall not dwell upon the diagnosis of these forms of coma from each other, but proceed to refer briefly to the treatment of each.

First, then, as to the *traumatic coma*. This is that state which surgeons describe under the name of concussion of the brain. We have unquestionable evidence that it is not a state of inflammation, or of active disease of any kind, but simply one of suspension of the powers of the brain due to the shock occasioned by the injury. We do not know exactly what the precise condition of brain is in this traumatic coma. It is, however, a state analogous to that of sleep, in which the natural actions of the brain are depressed rather than exalted; to use an expression borrowed from the Stock Exchange, they are *below par*.

In the milder cases, as when a patient is simply *stunned*, recovery takes place quickly and perfectly without any medical interference. Why should not this be the case with the more prolonged cases, in which the stunning effects of the injury last considerably longer? Indeed, I do not know why it should not; and I believe that in the great majority of cases this state of coma passes off spontaneously, just as it does in the slighter cases.

Are we, then, in cases of concussion of the brain, to content ourselves with looking on, and to do nothing? I believe opinion is rapidly gaining ground that this expectant method,—this system of non-interference,—is the best. Upon this point, however, I speak with diffidence, and must refer you to the great surgical authorities. I shall only add, that most of those with whom I have conversed on this subject have expressed themselves most favourable to this plan. Among them I may especially refer to my friend and neighbor Mr. Bransby Cooper, whose large experience at Guy's Hospital entitles his opinion to great weight. In conversation upon this subject, he likened the state of coma after concussion to a state of sleep which has a distinctly reparative object and effect.

Treatment of epileptic coma.—The epileptic coma is the most common form of coma we meet with; and here, likewise, the expectant mode of treatment, with moderate purging, answers better than any other. This condition presents many analogies to the traumatic coma. The brain experiences a shock from the epileptic discharge. The shock is generally followed by a longer or shorter sleep, from which the patient awakes up relieved, and often with no other symptom than a feeling of exhaustion. We do not find that anything cuts short the attack. Bleeding depresses the heart's action, and is favourable to the development of the epileptic state, and therefore it cannot tend to cut short the coma.

There are, however, cases of coma in which more active treatment than this is required; as, for instance, in cases of coma arising from rheumatic fever, gout, or scarlet fever, or in coma arising from poisoning by urea, in diseased states of the kidney. In such cases it is very necessary to do something more than watch: your treatment must be of the eliminating kind, such as blistering and purging; at the same time, it is necessary to uphold the powers as far as the digestive organs will admit. When you have reason to believe that the blood is poisoned by urea, as in renal disease, you will frequently find the hot air-bath of service; and you must give drastic purgatives, such as elaterium, or the compound powder of jalap, or the Iberis amara. In fine, as a general rule in the treatment of the comatose state which does not arise from pressure, you must bear in mind what I think I have made out in these lectures,—namely, that delirium is the slighter degree, and coma the more aggravated condition of the same state; hence, in a great measure, the treatments of the two conditions must be similar; for coma and delirium differ from each other in degree, the former being only an advanced stage of the latter affection.—*Medical Gazette, June* 14, *p.* 1031; *June* 21, *p.* 1077; *June* 28, *p.* 1097; *July* 12, *p.* 69; *July* 19, *p.* 109; *and July* 26, 1850, *p.* 133.

16.—TREATMENT OF CEREBRAL HYSTERIA, AND OF MORAL INSANITY IN WOMEN, BY ELECTRO-GALVANISM.

By Dr. LAYCOCK, Physician to the York Dispensary.

[In describing the characteristics of this peculiar condition, Dr. Laycock remarks:]

There is a disorder of the feelings, sentiments, and affections, which, when intense and permanent, constitutes moral insanity, but, in a minor degree, may be termed cerebral hysteria, and to which women with certain mental and corporeal characteristics are specially liable. It presents itself under the three forms of exaltation, depression, and perversion,—the latter a state often compounded of the two former. It depends on a functional disturbance of the cerebrum, but primarily and principally of that portion which is the organ of the instincts and emotions,—for there are no delusions or hallucinations, and no disorder of the intellect, except in the advance stage, when the functional disorder has become chronic, and mania, melancholia, or imbecility, has supervened. In its mildest forms, the disease is one of the most common to which the sex is liable, and, as constituting the primary or incubation-stage of moral insanity, it is one of the most distressing. It is also, when fully established, to be classed amongst the most incurable; for, although the intellect may be sufficiently restored to render the restraint of an asylum unnecessary, there often remains a permanent change in the character of the individual of a very distressing kind, because it gives the appearance of moral depravity, and too often really induces it. The gentle, truthful, and self-denying woman has unaccountably become cunning, quarrelsome, selfish; piety has degenerated into hypocrisy, or even vice; and there is no regard for appearances, or for the feelings or interests of others, except in so far as they may minister to the vanity or selfishness of the patient. In short, there is such a complete perversion of the character, that, when compared with the natural disposition and feelings, it can only be considered as a state of disease, and the result of previous changes in the encephalon.

The remedy I have to recommend as prophylactic and curative in cases of this kind is the preserving and systematic application of electro-galvinism to the abdominal and pelvic regions in combination with other means.

[Dr. Laycock divides the cause of the affection into three stages or phases. 1st. What he terms the etiological stage, as that of causation. In this there is general derangement of the health, unusual languor, irregular appetite, epigastric pain, with other dyspeptic symptoms. There is also constipation with irregularities of the uterine functions. As the disease proceeds, all these symptoms are increased, and with them, those also of dysmenorrhœa, or amenorrhœa. The countenance, besides assuming a muddy, sallow, and pinched appearance, exhibits a settled expression of anxiety and habitual gloom. The *stage of incubation* may now be said to have commenced, and the cerebral functions begin to be permanently disordered.

The patient becomes fickle, impatient, and restless, easily depressed or excited, and puzzling, with the variety and incongruity of her symptoms, her medical adviser and friends. As the 3rd stage gradually steals on, the symptoms become more decided and progressive, and characterised by a peculiar impulsive manner, shewing itself in all her actions,—nay, so disconnected do her ideas seem, that a character of great eccentricity, if not actual insanity, is liable to be stamped upon her. Although there may have been no illusions or hallucinations hitherto, yet, however, the transition from this state to confirmed insanity, is only a question of time; the peculiar form differing according to circumstances, assuming mania, melancholia, hypochondriasis, or only monomania.]

As the form which the disease assumes in its successive stages is never alike in any two individuals, so its causes vary. Primarily, in all in whom the cerebrum is decidedly involved, there is an existing predisposition to mental disease or cerebral disorder, either hereditary or acquired. Then functional or structural disease of various viscera has a direct incident excitor action or corresponding portions of the cerebrum and cerebro-spinal axis, and so induces local excitement and disorder therein. Thirdly, visceral disease leads to a morbid condition of the blood, so that the nervous system is injuriously acted upon from another quarter, and a general *neuræmic* condition is induced. This condition I have specially considered in my work on the 'Nervous Diseases of Women,' and its relations are very important and extensive. I do not propose to discuss those etiological questions at length, as I have only to trace such a general outline as will enable the reader to recognise the affection, and understand the *modus operandi* of the remedies.

Those who have paid any special attention to mental disorders, must have remarked how frequently diseases of the viscera are incident exciting causes of insanity. It is to be remembered, however, that slight changes in the temper and the feelings, arising from similar causes, are also dependent upon functional disturbance within the cranium, and belong, etiologically and pathologically, although not nosologically, to the class of cerebral diseases involving the mind. Disease of the heart frequently induces a most painful irritability of temper, or a morbid depression; disease of the stomach and liver will cause hypochondriacal feelings, and a depressing sense of anxiety about the future. Irritation of the intestinal canal will induce various forms of cerebral irritation, from epilepsy to mania; while uterine and ovarian irritation, which, in its slightest forms—as when connected with the monthly period in females—almost always exercise more or less influence on the temper and feelings at that time; operate also, indirectly, on the nervous system, by impairing the functions of *the kidneys*, and so rendering the elimination of the urinary salts from the blood imperfect. It is, however, to the direct and permanent morbid action of the ovaria on the cerebrum, that the change in the instincts and feelings is due, which I have described, and which invests the patient's actions with an unfeminine character, perverting all the feelings and sentiments connected with the sexual functions, either directly or indirectly, and so exciting insane cunning, destructiveness, infanticidal impulses, morbid appetites, &c. It is not possible always to say in what this morbid condition of the ovaria consists, nor, in many cases, how it arises, although, in a large proportion, it is evidently connected with displacement, congestion, or ulceration of the uterus or its cervix. Whatever may be its exact nature, when thus complicated with uterine disease, it draws the kidneys, stomach, and intestinal canal into the chain of functional disorder, and these re-acting upon the cerebrum and cerebro-spinal axis, and the latter on the former, we have the whole series of phenomena developed in its various modifications, according to the modifying influences of individual predisposition.

Hence it is of primary importance that the utero-ovarian disease be checked, and that the gastro-intestinal functions be restored to a healthy condition; for, unless these indications be fulfilled, there is little hope that the cerebral or cerebro-spinal disorder thence resulting, will be cured, or even palliated. The various remedies which are in ordinary use for these purposes,—as hip and foot-baths, leeches and counter-irritants to the spine, chalybeates, purgatives, enemata, sea-bathing, &c.,—are uncertain in their results, for, in many cases, we cannot even check the constantly increasing tendency to constipation. Now, it is as an aperient and emmenagogue that electro-galvanism, used in the mode mentioned, is most beneficial in these cases; and, without entering into any theory as to its *modus operandi*, I will state, that it is the most efficient remedy for this purpose that I am acquainted with. In proportion as it fulfils the indications of cure, by restoring the due action of the intestinal canal, and of the kidneys and ovaria, the morbid cerebral phenomena disappear, and the mind returns to its natural state. In one case under my care, in which there was the morbid condition of the will I have described in a most marked form, and a concomitant painful alteration of the character, the remedy was eminently successful; in three weeks the bowels were moved daily without purgatives or enemata, although these had been necessary for three or four years previously; the patient gained considerably in weight, improved daily in mind, and in four months the menses re-appeared, after having been wholly suspended *for five years*. The latter result was the more remarkable, inasmuch as the patient presented certain external characteristics which usually indicate atrophy of the ovaria.

Although the use of electro-galvanism as an emmenagogue is no new thing in medicine, it is to Dr. Cumming of Edinburgh that we are indebted for much valuable, and, I think, *new* information as to the class of cases, and the mode in which it may be most advantageously applied. I would particularly refer the reader to Dr. Cumming's paper 'On the Use of Electro-Galvanism in a peculiar Affection of the Mucous Membrane of the Bowels,' published in the 'Medical Gazette' for 7th December last,* and also an Appendix to that paper, in the same Journal for January 18th last, where he will find ample instructions as to the best mode of applying the remedy, the precautions that should be taken, and the adjuvants that should be administered.

I will only add one or two points necessary to be observed in the diagnosis of the early stage of this class of affections. The gastric derangement is the most distressing, and is characterised by a sense of uneasiness and depression at the epigastrium, accompanied by an undefinable anxiety and restlessness, usually the most intense at an early hour in the morning. The bowels are generally much constipated, the tongue scabrous, or presenting a rough, *fissured* appearance, the complexion muddy, the countenance grave, or peevish, or anxious. These symptoms being observed, attention must be directed to the uterine functions; and if leucorrhœa, or symptoms indicative of uterine congestion, displacement, or structural change, or of ovarian irritation, be found to exist, then the gastric or gastro-enteric phenomena must be considered as in etiological relation to the pelvic, and the daily local application of electro-galvanism, in the way pointed out by Dr. Cumming, will be the best remedy. Amongst the adjuvants that should be administered concurrently with its use, tar, in small doses, has been found to be the most effectual,—a remedy that we owe, I should add, to Professor Simpson,—and which is itself an excellent remedy for habitual constipation, without the aid of electro-galvanism.—*Medical Times, July* 20, 1850, *p.* 57.

17.—CURE OF EPILEPSY BY THE EXPRESSED JUICE OF THE COTYLEDON UMBILICUS.

By Thomas Salter, Esq., F. L. S., Fellow of the Royal Medical and Chirurgical Society, &c.

[Mr. Salter is seeking to introduce this new remedy to the attention of the profession, and says he has great pleasure to add now the experience of others upon the point, who agree with him as to its great usefulness. Mr. Salter recommends the fresh expressed juice where it can be obtained; but as this is not always easily available, he believes the liquid concentrated extract, prepared by Mr. Hooper, is of equal value. He recommends that great attention be paid to the general health; laying down a system of dietetics and exercise, the disuse of fermented liquors, the use of tepid sponging during the winter months, and cold sponging or shower baths in the summer, at the same time sustaining a proper temperature upon the surface by wearing flannel next the skin; and he then relates two cases as examples of its efficacy.]

Case I.—Joseph Lamport applied to me on the 25th of October, 1849, for the cure of epilepsy. He is a stout, well-made young man, of a florid complexion, 22 years of age, five feet ten inches high, by occupation a gardener. He has been the subject of epilepsy for the last five years: his fits are of frequent occurrence: they sometimes take place as often as twice in the day: a month appears to have been the longest interval that he has experienced between the attacks, but of late they have been more frequent than formerly. He states that they come on without any warning; he is insensible from ten minutes to half an hour: on recovering, he is sometimes sick and vomits, and suffers from weakness and headache, but in a few hours he feels quite well again. His appetite is good, bowels regular, and pulse natural. He was directed to take one drachm of Hooper's fluid extract of cotyledon water twice a day, and an occasional dose of compound rhubarb pill if the bowels required it. He has continued the medicine pretty regularly up to the present time (May 7th). The benefit he experienced was strikingly marked from his first taking it. He has had no fit for the last three months, and is in every respect at the present time quite well.

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* See Retrospect, Part XXI. page 148.

Case II.—On the 21st of October, 1849, I was consulted by a gentleman of about 20 years of age, who had been for some time the subject of epilepsy; but, from the fits hitherto occurring in the night, it was not known precisely how long he might have laboured under the disease. However, about six months since, previous to my seeing him, from the attacks occasionally occurring in the day-time, the complaint was detected. His parents had, however, for a long while suspected that something was the matter, from his sometimes not rising at the usual hour in the morning, and afterwards from his appearing dull and stupid during the day. Moreover, he had often been heard to make strange noises in the night; but, as he had been known to suffer from what is called nightmare, the circumstance did not give rise to the suspicion that he was affected with any serious disorder. This being once ascertained, his bedroom was changed, so that he might be within hearing of his mother.

The intervals between the attacks after this period varied from two to three or four weeks. Occasionally he had only one fit: at other times he would have four or five in succession in the course of one night. I now found on inquiry that he generally knew when the attacks were about to come on, from a peculiar feeling in his left arm and hand which took place the day previous. This was an uneasiness, scarcely amounting to pain, yet clearly allied to it: there was a feeling of stiffness, and an awkward inconvenience when it was moved; a crampy feeling with occasional twitches of the muscles, and contractions of the fingers, together with some numbness; but he was not aware of any aura before the attack. The patient was of small stature, of a nervous and irritable temperament, and considered to be weakly rather than otherwise, but had, notwithstanding, enjoyed good health. The appetite was good; the bowels were disposed to constipation. Before he was put upon a regular course of medicine for the relief of the epilepsy, I thought it right, in the first place, to clear the bowels, and to observe if any common source of irritation existed that might be thought directly or indirectly to have occasioned the fits. He was ordered to take a sufficient quantity of compound rhubarb pill to keep up a full action on the bowels, and to leave off suppers, of which he was accustomed to partake largely. But as the fits continued, and it was suggested that he might possibly have worms, he took at intervals of two or three days several doses of turpentine at night, followed by castor oil in the morning, and on one occasion a large lumbricus was passed. But this treatment had no effect in diminishing the paroxysms: on the contrary, they were thought to be decidedly more violent, particularly on one occasion,—the day following the use of the turpentine. On April 21st he was put upon the use of the cotyledon, and ordered to take a fluid ounce of the recent expressed juice of the plant twice daily. In the month of June, from the scarcity of the plant, he commenced the concentrated extract, as prepared by Mr. Hooper, which he continued up to September the 9th, about which time the fits left him, and have not since occurred, having previously gradually declined in frequency and severity. He continues now in good health; but, by his own desire, he still takes the cotyledon as a prophylactic.—*Medical Gazette, June* 14, 1850, *p.* 1025.

18.—CHLOROFORM IN NEURALGIA.

Some forms of neuralgia resist almost all the means used to subdue them, and anæsthetic agents may naturally be expected to be beneficial in such cases, both internally and externally. The 'Journal de Pharmacie' gives the following formula for a chloroform ointment: chloroform, sixty drops; hog's lard, one ounce. Mix in a mortar, and use two or three frictions a day upon the painful spot. As this ointment turns yellow when exposed to the light, it should be placed in a coloured, wide-necked, and well-stoppered bottle.—*Lancet, July* 20, 1850, *p.* 85.

19.—CASE OF SCIATICA CURED BY CAUTERISING THE EAR.

[However singular it may appear, M. Malgaigne did actually apply the red hot iron to the anterior part of the right helix in a case of sciatica, and his patient was cured forthwith. Similar success is stated to have resulted on more recent occasions at the Hospital St. Louis, and]

Dr. Lucciana of Bastia relates in the 'Journal des Connaissances Médico-Chirurgicales,' 1st May, 1850, a radical mode of curing sciatica, popularly practised in Corsica, and consisting in the application of a red hot iron to the ear, and exactly on its helix. The cauterisation cures the sciatica instantaneously, or at least effects immediate improvement. The operation is in Corsica uniformly performed by the farrier, and the inhabitants, when affected with sciatica, lose no time in applying for his assistance. In confirmation, Lucciana adduces some cases of sciatica which he had in vain attempted to cure in the hospital of Bastia by other therapeutical methods, and which yielded to the farrier's cautery, as if to a charm.

In relation to this kind of cure, and to its results, we recommend the perusal of the article 'Reumatismo' in the 'Instituzioni Chirurgiche di Monteggia,' parag. 499, in which mention is made of a priest "who cured sciatica by a small burn behind the anti-helix." The editor of the journal from which this article is taken, adds other authorities in support of the energetic method of cure revived by Lucciana. He cites Mercatus, who recommends, in sciatica, "to open the vein in the middle of the ear with a hot iron," and who probably took the hint from Hippocrates, who advised "in fluxes descending along the thigh, to open the veins behind the ear." Zacutus Lucitanus, in the second book of his 'Praxis Medica Admiranda,' has an article entitled 'Ustio venarum retro aures ischiaticis utilissima,' and professes himself well satisfied with the results which he had himself obtained by this method of cure in certain obstinate cases. He also tells how a traveller, who had long been resident in Japan, in his presence cured an obstinate sciatica, after it had resisted scarification of the skin behind the ears, by cauterising the same parts several times within the space of two hours with a hot brand of lignum vitæ.—*Monthly Journal of Med. Science, Aug.*, 1850, *p.* 173.

20.—CITRATE OF CAFFEINE IN HEMICRANIA.

Dr. Hannon advocates very strenuously the use of the above salt in hemicrania. We find in the 'Presse Médicale,' of Brussels, two long articles on the subject, with some cases and a good description of the caffeine and its preparation. It is to be given in doses, varying from five grains to one drachm: and the author has added formulæ for administering the citrate in the shape of pills, syrup, draught, lozenges, &c.—*Lancet, Oct.* 19, 1850, *p.* 451.

21.—ILLUSTRATION OF THE DIFFICULTIES WHICH BESET THE DIAGNOSIS OF SOME CASES OF DISEASE.

By Thos. Poyser, Esq.

Obscure Neuralgic Pains: Disease of the Brain, and Enlargement of the Liver. Mrs. —, aged 40, the mother of a large family, and a lady of great intellectual attainments, who had usually been in the enjoyment of good health, was attacked in the autumn of 1844 with acute pain in the right groin, or rather in the inner and upper margin of the ilium. The pain was limited in extent, and might be covered, as she expressed it, with her finger, but was so acute as to deprive her almost entirely of sleep, and to render any motion of the part nearly insupportable. There was no swelling, redness, nor any appearance of inflammation. This pain continued some months, without varying its seat or character, and but little controlled by treatment.

It was considered to be neuralgic; and every means that could be suggested, both constitutional and local, were tried by an eminent surgeon who then attended the case. During the progress of this affection, Mrs. M — herself discovered, while in bed, (to which she had long been confined by the neuralgic pain), a swelling in the right side below the liver. On examination, this viscus was found much enlarged, extending four or five inches below its normal size and situation, of a stony hardness; but unattended with pain or tenderness on pressure. It seemed to account for the pelvic pain, inasmuch as the pressure from this indurated mass on the nerves might occasion it. Mercury with taraxacum, and iodine and mercurial frictions, were therefore had recourse to, without any alleviation of the pain, or diminution of the hepatic disease.

In the spring of 1845, the patient was removed to her mother's house in this neighbourhood, and on April 5th I saw her. In addition to the enlargement of the liver, and the acute pain on the inner margin of the crista ilii, there was now tympanitis, the bowels being enormously distended with flatus. There was no pain in the head, no fever, and the pulse and tongue were natural: but there was a degree of irritability of mind and fretfulness which was remarkable, as Mrs. —'s natural disposition was peculiarly placid and gentle. It is unnecessary to detail the treatment, as but little or no relief was obtained from it.

The tinctura cannabis indicæ soothed and tranquillized the nervous feelings; and the unguentum aconiti as a local application, (suggested by Sir Benjamin Brodie, who was consulted,) in some degree assuaged the pain; but the general character of the symptoms continued unabated, till about the middle of April, when the pain began to diminish, and, in two or three days, went off altogether. After the removal of the pain, Mrs. —'s spirits and appetite improved; she was able to sit up and walk about her room; and although the tympanitic swelling and enlargement of the liver did not diminish, yet she was cheered by the freedom from pain, and the prospect of recovery.

On the 28th of April, while sitting in her chair, Mrs. — had an apoplectic seizure, which deprived her of speech and the power of swallowing, from which she never rallied. She expired May 3rd.

A *post mortem examination* was made thirty-six hours after death. On removing the calvarium, the external part of the brain presented no diseased appearance; but, on cutting into the left hemisphere, it was found to be quite degenerated in structure. The whole of the anterior lobe was converted into a thick purulent fluid; and, in the middle of this large abscess, there was a clot of blood the size of a walnut. This coagulum appeared to be of recent formation. The left middle lobe was pulpy and diseased, but the other parts of the cerebrum and cerebellum had a firm consistence and healthy structure. The abdomen was very large, from the bowels being enormously distended with flatus, but there was no extravasated fluid or gas in the cavity. The left lobe of the liver presented a very diseased appearance. It was enlarged to more than twice its usual size, had almost a stony hardness, was mottled and tuberculated externally, and on cutting into it, its texture was gristly and exhibited that diseased structure termed mammary sarcoma. The inner edge of the ilium, where the pain had existed so many months, was carefully examined, but there was no morbid appearance discoverable in the part, or in the nerves leading to it. The thorax was not opened.

Remarks.—This case is, I think, interesting and worthy to be recorded. It shows that the symptoms did not point to the true seat of disease, till a short time before the patient's death; and that extensive disorganization may be going on in the brain, without impairing its functions, or manifesting those signs by which it may be detected. The fretful and altered manner of the patient led to the apprehension that softening of the brain might be going on; but the total absence of pain in the head, and of rigors, or any indication of inflammatory action, rendered the diagnosis very difficult. It is highly probable, that the pain in the right side of the pelvis was occasioned by disease of the left side of the brain, and furnishes an additional instance to those recorded by Sir Henry Halford, where neuralgia was the effect of cerebral disorganisation. When the latter disease had so far advanced as to disqualify the nerves from suffering so exquisitely, then the pain ceased. This case shows the importance of attending to the brain, in all long-continued and obscure neuralgic pains, although the functions of that organ may not be impaired.—*London Journal of Medicine, August*, 1850, *p.* 731.

22.—TREATMENT OF TRAUMATIC TETANUS.

By H. R. De Ricci, Licentiate of the College of Surgeons in Ireland.

[Mr. De Ricci thinks, in cases of tetanus, we are justified with a view of removing the exciting cause to amputate the entire foot, or to divide the nerves leading to it. We must also endeavour to check the disordered action of the nervous system, by equalizing the powers of the brain with those of the excito-motory apparatus on the one hand, and rendering the muscles incapable of obeying the erratic dictates of the spinal cord, on the other. For in this disease the energies of the brain are minus, while those of the spinal order are plus. The first we effect by stimulants, such as wine, brandy, and especially the resin of Indian hemp, which possesses the property of exciting the brain independently of other parts of the human frame; and the second by tobacco enemata and fomentations. Although the latter remedy is dangerous in unskilful hands, yet under careful restrictions it is highly valuable, the muscles under its influence gradually relaxing from their rigidity, and becoming unable to execute any automatic movement. By these measures, continues Mr. De Ricci,]

Our patient is now in a state of comparative ease; his brain is exalted in its energies, and thus enabled to counteract the spasmodic motions of the spinal cord; and, when it fails, the paralysed condition of the muscles comes to its aid, by refusing to act in compliance with the impulse. The pain at the ensiform cartilage too is relieved, and the patient's forces are no longer exhausted by overpowering convulsions. When once the patient is brought to this condition, his safety is almost a matter of certainty; for what is the cause of death in tetanus? it is either exhaustion or asphyxia, and not any specific action or morbid poison inherent to the disease itself. Asphyxia is caused by the persistent rigidity of the respiratory muscles; exhaustion, by the repeated attacks of spasm. But, by the treatment I suggest, both these conditions are done away with, the sufferer is relieved from any immediate danger of impending death, and his nervous system has now time to correct the morbid functional condition into which it had lapsed, and by degrees will resume its normal functions.

[In proof of the practical value of his theoretical views. Mr. De Ricci subjoins the particulars of the following cases:]

Patrick Carroll, aged 25, stone-mason by trade, was admitted into Parsonstown Infirmary on the 20th of July, 1841, with a lacerated wound of the great toe, caused by the fall of a large stone on it, which had nearly severed the first phalanx, injuring at the same time, though in a less degree, the second and third toes of the same foot. The accident occurred at four o'clock, p.m., and the man was admitted into hospital almost immediately. He got a cathartic mixture, and a spirituous lotion was applied to the wound.

At eight o'clock the same day (precisely four hours after the receipt of the injury), Dr. Waters was sent for to see the man, who, according to the nurse's report, had had several fits during the last half hour. He at once recognised the so-called fits as tetanus, all signs of which were prominently marked. At this period the muscles of the neck, face, and abdomen, were *permanently rigid*; and the spasms violent, and recurring at intervals of less than two minutes. He complained of soreness and stiffness about the throat, and difficulty of swallowing; he was bathed in perspiration, and greatly alarmed about himself. His pulse was 130, small, and the characteristic risus sardonicus was strongly marked. He was ordered tobacco fomentations over the abdomen, and a tobacco enema (fifteen grains of tobacco to eight ounces of boiling water) every half hour, so as to keep up a state of nausea, this to be thrown up with O'Beirne's tube.

20th July, 10 p. m., *six hours after the accident*, he was greatly prostrated, and complained of deadly sickness; he had vomited large quantities of a dark green fluid; the spasms were as violent as ever, and the muscles rather more rigid. Emprosthotonos strongly marked; pulse 100, very small. Ordered to continue the fomentations and enemata, the frequency of the latter to be regulated by the effect, so that a constant nausea should be kept up. A liniment of croton oil and turpentine was also ordered to be rubbed along the spine, until a free eruption was produced.

21st, 10 o'clock, a. m., *eighteen hours after the accident;* during the night he has had twelve enemata, and the fomentations have been continued uninterruptedly: thus the nausea has been maintained. As his bowels had not been freed, he was ordered two drops of croton oil.

21st, 10 o'clock, p. m., *twenty-eight hours after the accident;* spasms less violent, and the interval between them increased to five minutes. The patient is now for the first time inclined to sleep, but is prevented by the recurrence of the spasms; he swallows with difficulty; pulse 100, very small. Nausea continues under the incessant administration of the tobacco enemata and fomentations; he, however, expresses himself as being better. His bowels not having been acted on, he was ordered three drops of croton oil, to be taken at once.

22d, 10 o'clock, a. m., *forty-two hours after the accident.* The patient is considerably better; spasms are much less violent, and the interval between them is increased to ten minutes. The muscles are still very rigid, but he complains less of difficulty in deglutition. Bowels well acted on.

22d, 9 o'clock, p. m., *fifty-three hours after the accident.* I was disagreeably surprised at finding the patient much worse, the spasms had considerably increased in violence, and the interval was again reduced to five minutes. He has great anxiety, no inclination to sleep, great difficulty in swallowing, intense rigidity of abdominal muscles; pulse 130, very small. He was ordered the croton oil and turpentine liniment again to the spine, and the tobacco fomentations and enemata to be continued incessantly.

23d, 10 o'clock, a. m., *sixty-six hours after the accident.* I found him much better this morning, the rigidity of the muscles considerably diminished, spasms less violent, and the interval increased to ten minutes; deglutition less difficult; pulse 100; bowels well freed.

23d, 9 o'clock, p. m., *seventy-seven hours after the accident.* Continues better; spasms less violent; rigidity of muscles is diminishing; easier deglutition; pulse improved; bowels free. Ordered a tobacco enema every third hour only

24th, 10 o'clock, a. m., *ninety hours after the accident.* Much better this morning; he has slept well during the night; swallows well; rigidity of abdominal muscles almost disappeared, and he declares himself quite well. All medicines were now suspended, and he rapidly recovered. During the course of his illness, he got plenty of wine, brandy, and beef-tea. The wound constantly presented a healthy appearance.

In the foregoing case, which was one of the most acute on record, death was averted by means of tobacco and stimulants; I do not say cured, as I consider that was effected by nature. He had, however, a very narrow escape on the recurrence, or rather the exacerbation of the symptoms fifty hours after the accident; and I am firmly convinced that he would not have run that risk, had his lacerated toes been removed on his admission into the hospital. He recovered, however, perfectly, and lived till last summer, when he fell a victim to the cholera.

These are, therefore, the conclusions I come to with regard to the treatment of this disease:—to endeavour, if possible, to combat it at its outset, and commence by removing the existing cause, either by excision, amputation, or division of the nerve leading to the part; to give stimulants, such as brandy, wine, and the tincture of the resin of Indian hemp, in doses of from ten to twenty drops every half hour, so as to produce a slight degree of cerebral excitement; to support the patient at the same time by giving beef-tea and eggs; to pay attention to the state of the bowels, and act upon them with croton oil or any other powerful purgative, as in this disease, as is well known, they are extremely torpid and sluggish: and to bring him under the influence of tobacco as rapidly as possible. These are the principal means upon which we have to rely; but, at the same time, I must not omit to warn every practitioner against the use of opium, belladonna, and every other narcotic, which it has been the fashion to administer indiscriminately in every case of tetanus, both in hospital and in private practice, not so much with the view of curing the patient as of stupefying his intellect, so as to render his exit from this world less painful.

And now, before I conclude, let me add a few words concerning those individuals who, in consequence of some idiosyncrasy, cannot be subjected to the continued influence of tobacco without incurring extreme danger. Those possessing such an idiosyncrasy are easily distinguished, as a few minutes after the administration of the first dose symptoms of the most alarming nature will arise: the countenance will assume a deadly hue and a ghastly appearance, and the pulse at the wrist will become quivering and intermittent. I need scarcely say that in such a case the administration of tobacco should be at once stopped, ammonia applied to the patient's nostrils, cold water sprinkled on his face, and every means used for the excitement of cardiac action.

In these cases, after having discarded the use of tobacco, the main reliance is to be placed in vapour baths, which should be applied without removing the patient from his bed, and continued for a considerable time. The patient will invariably express himself as much relieved by them, and they generally diminish the rigidity of the muscles in a very considerable degree, at the same time that they sooth the patient and allay the spasms.

By adopting such a method of treatment as I have endeavoured to describe, we shall not, as I said before, cure *every* case of acute traumatic tetanus, but we shall certainly give the unfortunate sufferers a much better chance of recovery than by abandoning them to the old routine treatment of calomel, opium, and belladonna.—*Dub. Quarterly Journal, Aug.* 1850, *p.* 64.

23.—TRAUMATIC TETANUS CURED BY FRICTIONS WITH TINCTURE OF BELLADONNA.

[The following case is from the 'Gazette Médicale':]—

M. Bresse, surgeon at the Military Hospital at Rennes, proposed, in 1848, the treatment of traumatic tetanus by the application of tincture of belladonna, and reported a case, in which it had been successfully employed, in the 'Gazette Médicale de Paris' of Sept. 30, 1848. M. Bresse has now placed on record another case which has come under his notice. The patient, one of the *Garde Mobile*, received a wound on the 20th of March; tetanic symptoms appeared on the 5th of April. Frictions of belladonna were commenced on the 6th, and by the 12th the patient was out of danger. Imprudently exposing himself to cold, the tetanic symptoms returned in the muscles of the back, but were quickly removed by again having recourse to the frictions. The tincture employed was composed of five parts of extract to eleven of alcohol, and was applied all over the body, and more particularly over the rigid parts.

M. Bresse adds, that another practitioner has arrested trismus, which he feared would proceed to general tetanus, by the same means.—*Med. Gazette, August* 9, 1850, *p.* 263.

24.—CATALEPSY, OR TRANCE.

By Dr. Ebenezer Milner, Edinburgh.

[With regard to the pathology of catalepsy, Dr. Milner remarks—]

Catalepsy is undoubtedly more a lesion of function than of structure. The close approximation of its symptoms to severe hysteria shows that those two morbid affections are closely related; and the circumstance that the paroxysms of either are produced by the same causes, would tend to support the hypothesis that they are merely forms of one and the same disease. In hysteria the muscles are convulsed clonically,—that is, with motion; in true catalepsy they are convulsed tonically, that is, without motion; and in this rests the principal difference between the two.

The nervous system, or rather centres, have their functions in abeyance during the paroxysm,—there is, in fact, a triple lesion of sensibility, of intelligence, and of muscular motion.

Although it is impossible to define or determine the nature of the cerebral disorder in this disease, in true cases of simple catalepsy, in consequence of but few cases terminating fatally, yet it has been noticed, that the state of congestion of the brain is distinctly traceable where individuals have died of catalepsy complicated with mania. In two cases of this kind, given in the 'Dictionnaire de Medicine,' the brain was found in one much injected with blood; the grey matter on the surface of the convolutions was firm and had a roseate hue; the medullary substance presented a large number of mouths of vessels gorged with blood; and the *corpus callosum* was softer than usual. In the other case, the grey matter was observed to be of a dark colour, approaching that of violet, and the medullary substance presented the *puncta vasculosa* large, numerous, and filled with blood. It must be remembered, however, that the same pathological phenomena are observed after death from true uncomplicated mania.

Diagnosis.—This disease has been confounded with hysteria, ecstacy, asphyxia, apoplexy and syncope, tetanus, and the state of death. The older physicians also mistook death from cold for catalepsy, and described cases of soldiers in a state of catalepsy riding into the camp on horseback, firmly seated like statues on their saddles. Here, death from intense cold formed a source of error.

Although our knowledge of the distinctive marks of the diseases liable to be mistaken for trance is now so great that no physician ought to fall into error, yet it is necessary to notice briefly the signs by which a correct diagnosis may be made.

1. From true ecstasy, catalepsy is distinguished by the patient labouring under the former disease being occupied in profound and sustained meditations. The faculty of thought, instead of being annihilated or suspended, is found exclusively directed towards the contemplation of a single object, entirely absorbed with one idea, with some imaginary pleasant object, the powers of imagination being augmented by an enthusiastic exultation. Again, there are no convulsive movements, no rigidity, partial or complete, of the muscles; and, above all, the limbs, if placed in any position by the physician, do not retain that position, as they will in simple, and oftentimes in complicated, catalepsy.

2. Catalepsy is distinguished from hysteria by signs which have been noticed when speaking of the pathological nature of the disease. In hysteria the muscular system is oftentimes strongly convulsed, and motions are performed, but the most distinctive sign is the non-retention of any posture in which the patient may be placed.

3. Asphyxia is accompanied with suspension of the functions of respiration and circulation; the countenance is also ordinarily livid and swollen, the mucous membrane of the lips having a very dark hue.

4. Syncope is distinguished from catalepsy by the state of the muscular system, the limbs being extremely flexible,—and this appertains also in a great degree to asphyxia,—and by the general pallor of the countenance and surface of the body, consequent on the suspension of the heart's action.

5. Apoplexy is known from it by the stertorous or sonorous breathing, by the more or less profound lethargy, by the lax state of all the muscles of the body, and also by the co-existence of paralysis.

6. Although tetanus has been mistaken for catalepsy, in consequence of the tension and rigidity of the muscles, yet the fact that neither sensibility nor the intellectual functions are interfered with, should have prevented such a mistake from being committed.

7. Patients laboring under an intense and prolonged paroxysm of catalepsy have been supposed to be dead, and have been interred alive.

There are numerous cases of this kind on record, and many more where the individuals, after being laid in their coffins, have fortunately recovered from the attack before the period of interment. In such cases, the respiration is insensible, and the heart's action is almost in abeyance; the surface of the body is nearly cold, and presents the pallor of death; and the articulations are stiff. Although it is no doubt a difficult task to distinguish this state of trance from the state of death, yet a careful examination of the body, and, time, would lead to a correct diagnosis. The limbs after death are first lax, then stiff, and ultimately lax again. The stiffness of the limbs, known as the cadavern rigidity, or *rigor mortis*, lasts for a longer or shorter time, according to circumstances; the sooner it supervenes, the shorter is its duration, and conversely. Now the stiffness of the limbs accompanying this intense form of trance, supervenes at once, and lasts as long as the paroxysm continues. This is consequently a valuable diagnostic sign.

Again, as the heart's action most certainly continues in a slight degree during the attack, the stethoscope may be used with advantage to detect the impulse and murmurs. The state of the eyes and the expression of the countenance, as well as the circumstance that the temperature of the body may be sustained in a slight degree, also furnish means by which a diagnosis may be made.

If pressure be made on the eye-ball a few hours after death, the cornea becomes opaque; and this occurs invariably. But if the least spark of life remain, that effect would not be produced. This may, therefore, be said to be a sign at once distinguishing the state of trance from that of death—one of ready application, and thus rendering wholly unnecessary the carrying out of the suggestion that inhumation should never be proceeded with until the body has shown unmistakeable signs of decomposition.

Catalepsy is a disease which is often feigned, sometimes for the purpose of exciting the sympathies of the charitable, occasionally by soldiers to procure their discharge from the army, often by females in good circumstances merely from a desire of creating an interest in their behalf, and by itinerating mesmeric impostors. To detect the imposition is oftentimes a matter of great difficulty, all the symptoms and signs of trance being exhibited with great truth. Such persons require to be carefully and vigilantly watched, and their character inquired into, when some inconsistencies will be noticed, and their imposition detected. Perhaps the inhalation of chloroform, where malingering is suspected and is necessary to be known, would be of great service. However slowly the individual breathed, the anæsthetic effect of this fluid would be produced; and then if he did not speak or move while the effect lasted, it is more than probable that he would do so on recovery. This is merely thrown out as a suggestion, which I believe may be used successfully in most cases of malingering.

[On the whole it would appear that catalepsy is not to be esteemed a dangerous disease, although many cases terminating fatally are recorded; but these were for the most part complicated with other diseases. With regard to the treatment, Dr. Milner says the cold bath is injurious, but hot baths, and pediluvia have been found useful. The most effective means, however, seems to be hot pediluvia and the cold douche applied to the head at the same time. The patient cannot swallow medicines; but if there should be any sensibility remaining, ammonia and other stimulants might be applied held near the nostrils. Friction of the surface of the body with rubefacients might be useful. Stimulating enemata might also be of service by relieving the bowels, and acting as a stimulant to the circulation in the parts. It is during the interval between the attacks that therapeutic remedies are likely to be of any avail. The treatment may be summed up in a few words—the cause must be searched for and removed, if possible. If a hemorrhoidal hemorrhage has been suppressed, leeches must be applied round the anus. If there are worms in the intestines, anthelmintics must be given; or if it be caused by the retropulsion of an exanthematous eruption everything must be done which can remove the irritation caused thereby.]—*Edinburgh Med. and Surg. Journal, Oct.* 1, 1850, p. 328.

DISEASES OF THE ORGANS OF CIRCULATION.

25.—FATTY DISEASES OF THE HEART.

By Dr. Richard Quain, Physician to the Hospital for Consumption and Diseases of the Chest.

There are two forms under which fat presents itself as a disease of the heart. In one of these forms the fat, composed of large cells containing oil, identical with the fat found in other parts of the body, grows upon and extends over the surface of the heart; it then encroaches on, and insinuates itself between, the muscular fibres, in some cases to such an extent as to completely conceal them when the examination is made with the unassisted eye. In the other form of disease, a fatty matter, composed of granules and small oil-globules, occupies and fills the sheath of what was previously muscular fibre. In the one form of disease fatty tissue *grows* on and outside the fibre, in the other the muscular fibre itself *degenerates* into molecular fatty matter. A distinction thus broadly marked in the anatomical characters of these two forms of disease, and in their mode of origin, requires to be clearly expressed in the designations given them. It will, therefore, be well to apply the term *fatty growth* to all cases in which fat tissue constitutes the morbid condition, even though it may encroach so far on the muscular fibres as to cause their apparent transformation into fat; whilst the term *fatty degeneration* will be limited, as in strictness it should be, to those cases in which the muscular fibre degenerates into molecular fatty matter. The necessity for this distinction will be evident as we proceed.

[Speaking of the fatty growth on the heart, Dr. Quain remarks, that it is ascertained with some degree of certainty, that from any circumstances which will promote the formation of fat in general, the heart will partake largely of the accumulation. We must be content in knowing that the material of the fatty tissue must be derived directly or indirectly from the blood, and that the quantity of the one must bear a relation to the supply of material from the other. Dr. Quain continues:]

We know that the quantity of fatty matter in the blood is in direct relation with that supplied by the food on the one hand, and on the other with the greater or less freedom which exists for the free elimination of its elements in the respiratory process. We, therefore, feel, that if the food is deficient in the materials which readily constitute fat, and the respiratory process is accelerated and increased by abundant exercise, little fat can be formed. Equally true is the converse, that those who fare luxuriously and lead sedentary lives will grow fat. In the one case, neither the body nor the heart will suffer; in the other, in the general accumulation, the heart will certainly participate. Beyond these general principles I fear we cannot go, and even to these there are exceptions.

Fatty degeneration of the Fibre itself.—In the following observations I seek to establish the fact, that the molecular fatty matter in the fibre is the result of a chemical or physical change in the composition of the muscular tissue itself, independent of those processes which we call vital.

Anatomists are well acquainted with the substance named adipocere, and with the facility with which it frequently forms in dead animal tissues excluded from the air and exposed to moisture. Much difference of opinion has existed amongst chemists as to the origin of this substance. All admit the great quantity of fatty matter in its composition. One class, however, which includes Gay-Lussac, and Berzelius, believes that "the compound results entirely from the fat originally present in the substance, and that the fibrin is completely destroyed by putrefaction." The other class, which includes Dr. Thomas Thomson and Mr. Brande, believes "that the fatty matter is an actual product of the decay, and not merely an educt or residue." The correctness of the latter opinion is shown by the following observations: A piece of this substance, obtained from the muscular part of the thigh of a horse (portions of the specimen are in the British Museum and in that of the Royal College of Surgeons,) was submitted to examination. In its general appearance it resembles spermaceti. It is rather darker coloured and more fragile. Its surface is marked by irregular outlines of a red colour, evidently the boundaries of the fasciculi of the muscular fibres; it emits a strong amoniacal odour, floats on water, and is nearly all dissolved in ether. The ether, when allowed to evaporate, leaves a large quantity of granular and fatty matter.

The trifling undissolved residue presents, when floating in water, a delicate flocculent appearance. Examined with the microscope, the flocculent matter is found composed of delicate filaments forming a cellular web. In some parts the filaments presented something of a longitudinal arrangement, in others the web appeared perforated by regular foramina.

A microscopic section of the adipocere itself, unacted on by any agent (the section being made with a knife slightly warmed, required by the fragility of the substance,) showed the following appearances:—1st. Bands running longitudinally, as in the arrangement of the muscular fibres. These bands are dark coloured and opaque, except at the broken edges or extremities; at these points they are seen to be composed of small crystalline scales. The wavy outlines of the blood-vessels or nerves are sometimes seen between the fibres or fasciculi. In the intervals may be observed flat discs composed of radiating acicular crystals. These appearances vanished on putting ether on the specimen, and the merest particle of the filamentous substance remained.

From these observations I conclude, that whatever be the nature of the process, the places of the muscular fibres, the blood-vessels and nerves are occupied by fatty matter, which could not have existed in them during life. This opinion is confirmed by experiments on what may be called the artificial formation of adipocere. Mr. Gibbes, whose communications to the Royal Society have been just mentioned, states that Lord Bacon had indicated the mode of converting the waste flesh of animals into fat, which might be used for various domestic purposes. Mr. Gibbes, acting on this idea, succeeded by different processes, including exposure to running water, to nitrous acid, &c., in converting large quantities of animal flesh, even the carcase of a whole cow, into fatty matter. The difficulty which the experimenter met with in freeing this substance from colour and smell, or his death, appears to have prevented the communication of his further proceedings, which he had promised to the Society, and neither his nor Lord Bacon's discoveries have been made useful in supplying fat from waste flesh. To the pathologist they afford information of peculiar interest in connection with the following experiments:—A little more than two years ago I obtained, for the purpose of examining the healthy structure of the tissue, the healthy heart of a healthy child who had died a few hours previously from the shock of a severe burn. Having satisfied myself on the required point, I placed the specimen in weak spirit and water (one part to eight or nine,) for the purpose of future examination. On looking at the specimen after a few weeks, I found it greatly changed; it had a confused granular aspect, to such an extent, indeed, as to lead me to feel, that there must be some error in previous observations on the specimens of true degeneration, as portions of a healthy heart now exhibited characters similar. I found, however, that this change existed in all parts of a heart, which I had no doubt had been healthy, in some parts at least, when previously examined. I mentioned the observation to Dr. Williams, and was gratified at hearing from him, that the fact of this change was an illustration of an experiment which he had suggested to the clinical assistant, Mr. Edward Palmer, some time previously, viz., to try whether fatty matter was not formed after death by a molecular change in the animal tissues kept excluded from the air but exposed to moisture.

He suggested further observations of this specimen, and some further experiments. These have been made, and the result has been, that the heart first described presents the most marked and universal character of true fatty degeneration. It is of a pale cream color, it is soft, portions of it float in water, and when examined by the microscope exhibit the most advanced state of degeneration, differing from that which occurs during life in this respect alone,—that it is universal. Every fibre is fatty, whilst in that degeneration which occurs during life, many fibres retain their healthy organization.

A specimen of a sound sheep's heart, placed in very diluted nitric acid, has been traced through a series of similar changes; but as a shorter interval has elapsed, it has reached a less advanced stage. The specimens have been examined by Dr. Williams, Mr. Quekett, and Mr. Toynbee, and others. The blood-vessels and nerves participate in this change. It does not appear necessary to illustrate further the conversion of these tissues after death, external to the body, into fatty matter,—we shall, therefore, turn to inquire whether like changes do not occur within the body and before death. Dr. Babington has apparently observed the formation of fatty matter in the blood at the expense of the albumen. Dr. Williams, in the first edition of his 'Principles of Medicine,' recognizes the presence "of fat in softened tubercle, pus, atheroma, and gangrene of the lungs, as being derived from the debris of animal matter, as in the conversion of flesh into adipocerous matter." In a subsequent edition of the same valuable work, further illustrations of this process, and of the circumstances under which it occurs, are clearly given. M. Rokitansky mentions several instances in which fat may be found (as in masses of fibrin, in non-vascular tumors, in the walls of arteries, &c.,) in situations in which its presence could not be deemed the result of a deposition from the blood. Mr. Paget mentions a striking example of this change observed by him in some masses of what had been medullary cancer of the liver, "certain parts of which, when examined, were found to consist almost entirely of oil globules." I have seen the same appearance in the central softened portion of a large mass of tubercle from the kidney, the fatty globules being there infinitely more numerous than in those parts where the softening had not commenced. Dr. Copland has recently communicated to me the particulars of a case of chronic inflammation of the membranes, covering the spinal cord, which caused paraplegia. The patient finally died from the paralysis extending to the muscles of respiration. After death, the recent effusion of plastic matter which existed on the upper part of the cord was found to pass inferiorly where the inflammation had first commenced and ceased, into a soft, fatty matter. The same learned authority mentioned to me at the same time another case, in which the central portions of some large bands of adhesions, found in a case of chronic peritonitis, consisted of fat.

I find a case recorded without particular reference to this point, by Dr. Archibald Hall, in which the fibrin of a hemorrhagic effusion into the theca vertibralis consequent on a fall was found, after an illness of some months' duration, changed into fat. The fatty matter here formed independently of a direct connection with the vascular system, is, at least in such of the cases as have been examined with the microscope, and they have all been but the two last-mentioned, found to be in all its characters analogous to the granular fatty matter observed not only in degenerated muscular fibre, but in various other organs which are the seat of fatty degeneration. Here, then, a most important question arises,—Is the fatty matter which is found in the degenerated muscle of the heart derived from a molecular change in the texture, or is the fat deposited from the blood? In answer to this question we refer to the preceding facts. We have seen the substances analogous to muscle in composition converted both in and out of the body into this same fatty matter. We have traced also the muscular fibre itself undergoing (external to the body, and thus beyond the reach of deposition or the influence of the nutritive process,) a change perfectly identical with that which it undergoes in the living body. There is, therefore, a presumption in favor of the view which holds, that the processes in both cases are identical; that, in fact, when these protein compounds, albumen and fibrin, are effused in a form which is not readily susceptible of organization, when even they enter into the composition of tissues and textures, the organization of which is imperfect from inherent depravity, from natural decay, or from a deficient supply of those elements and influences, in the absence of which nutrition fails. that in these cases I say those substances degenerate and pass into fatty matter. In other words, that when the vital power which belongs to these higher products of animal organization is weakened or destroyed, they yield to the physical and chemical influences which surround them, and by an inherent principle descend into a class which is shared by them in common with plants and minerals. It would be highly interesting to illustrate this argument by facts drawn from the multitude of instances in which different observers have recently found this fatty degeneration. Some of these facts no doubt readily suggest themselves, though, perhaps, less in the case of the heart than in other organs. It is this organ, however, which claims our attention here. An interesting observation made by Mr. Paget supplies a most important step in this inquiry. It is now pretty well established, that a cell germ, or nucleated cell, is an essential element in the nutritive process of all tissues. The first change that can be traced in the process of degeneration of the heart's fibres, and it requires care to observe it, is the destruction of these cell germs in the tissue. Mr. Paget writes: "When the change is least marked and but little fatty matter has collected within the sarcolemma, the outlines of the nuclei look dim, and they lose their color. In the further advanced stage, the nucleus of the fibre cannot be seen at all; its former place is indicated, if at all, only by some out of the narrow column of yellow granules, and in a yet later stage, or when the sarcolemma appears nearly full of fatty particles, all trace of both the nucleus and these granules is lost."

Thus we have evidence, that the nutrition of the heart is impaired, and that those powers are weakened, by which it is enabled to resist the influences which tend to the disintegration of its tissue. A review of the circumstances under which this degeneration occurs, is further confirmatory of the view adopted here. These circumstances exhibit impairment of general and local nutrition.

[The most prominent effects of fatty degeneration on the functions of the heart are those which exhibit the deficient powers of the organ. Dr. Quain first considers]

Coma.—Several writers have described coma, preceded or not by giddiness in connection with enfeebled powers of the circulation. Mr. Adams, whose cases have been previously mentioned, observed as many as twenty attacks of coma in one of them. Mr. R. W. Smith and Dr. Stokes have made similar observations. The explanation of these attacks is this, that the power of the heart is reduced, and thus it is rendered incapable of readily sending on the blood which it receives,—hence arises obstruction to the circulation and unequal pressure on the brain. The explanation is no doubt correct.

Syncope.—Cardiac syncope is a term properly and more frequently used by the older writers than by ourselves, notwithstanding the arguments of Bichat on the subject. Dr. Burrows, in his interesting work on the Cerebral Circulation, has clearly established the fact, that syncope is due to a deficiency of that pressure within the skull which is essential to the performance of the functions of the brain. On this principle we can explain the frequency with which this symptom is found to occur in fatty disease of the heart.

The case of an old man who fell under the notice of Dr. Williams and myself is very remarkable. I was one day suddenly called to him, and found him, as I myself and others believed, dead. He had been in his usual state, and taking his dinner a few moments previously. Though neither pulse nor respiration could be perceived, nor in a hurried examination could the sounds of the heart be heard, I felt from something about his appearance that he was not dead. An electro-magnetic apparatus was set to work from the spine to the region of the heart; other stimuli were made use of, and after several minutes he slowly recovered. These fits, in a slighter form, recurred almost daily for two years, when he died in one exactly like the first. The heart exhibited fatty degeneration. In some cases this feeling amounts to nothing more than a sense of faintness, a feeling that the person must fall if he does not lay hold of something; and in some instances, as in a case at present under my care, this slight faintness is accompanied by an impression that he is about to die. Such persons do die. This mode of death is in many cases instantaneous, in other cases death, though sudden, is not so rapid in its occurrence, the fatal faintness is progressive, and death may not occur for several minutes after its onset. Facts within my knowledge lead me to think, that many distinguished men have thus died, and that in this condition has lain the hidden and frequent cause of many sudden deaths. The paleness of the features, the unaltered state of the pupils, the absence of stertor, and the feeble action of the heart, enable us to distinguish these cases from apoplectic seizures when we see them before death. The age also at which apoplexy occurs most frequently, is not that at which we most frequently find fatty degeneration of the heart. For example, of forty-nine cases of apoplexy, forty-two occurred in persons under sixty, and seven only in those over sixty; whereas, in seventy-nine cases of fatty degeneration of the heart, forty-one were above sixty years of age.

Shortness of breathing is recorded as having been present in about one-half the cases. In some cases it appears as a sense of choking or suffocation,—the person feels as if breathing through a sponge. In some instances the difficulty of breathing is so slight, that it is scarcely regarded; in others so severe, that the slightest effort, particularly in mounting ascents, is most distressing. A peculiarity was observed in two subjects, one of which still lives, viz., that reading aloud caused no inconvenience, whilst it was distressing to ascend a gentle height.

[Another of the recorded phenomena connected with fatty degeneration of the heart is *pain*. In some cases it is confined to the region of the heart; in others, it extends over the chest and down the arm, as in angina pectoris; but—]

There is some evidence to show that rupture of a few fibres may occasionally occur without being fatal and cause pain; but in the majority of cases, the pain appears to be due to over-distension of the cavities with blood on the one hand, or to the spasmodic contraction just alluded to on the other, it being remembered, that though the heart in health does not possess common sensibility, it may in diseased conditions acquire this property. These latter phenomena, that is to say, syncope, breathlessness, and pain may occur separately, or two or all of them may be present at the same time; their combination gives us the characters of the disease known as *syncope anginosa*, or *angina pectoris*. The symptoms or phenomena of this disease were very well recognised, even before Heberdon or Rougnon, who wrote at the same time, described them as constituting a special disease. Still, from that period to the present, the immediate condition on which they depend has been a source of great doubt.

This is not the place to discuss all the causes which may produce these effects. For the present, it is sufficient to show, as has been already done, that this degenerated condition of the heart's fibres is a very sufficient source in itself of the several phenomena, (viz. breathlessness, faintness, and pain,) which are recognised under the name of *angina pectoris*, or *syncope anginosa*.

[With regard to the treatment of this fatty degeneration of the heart, Dr. Quain observes:]

We have no evidence to show that we can restore muscular fibres which have been destroyed; all, therefore, that we can hope for in these cases, and that not always, is to arrest, or suspend for a time, the progress of the disease by improving the quality of the blood, and thus supporting the vigor of those portions of the heart still uninjured. The nervous powers being at the same time strengthened, and the blood itself rendered a better stimulant. The effect of treatment calculated to promote these objects is often very striking. I have found attention to the digestive organs, in the first instance, useful; bitter tonics, with alkalies, and subsequently iron in different forms, seemed to act most advantageously, I need not enumerate the habits of life, change of air and scene, dietetic regulations, &c., by which the general health, and with it the part most in need of it, may be improved.

In reference to some of the symptoms, I might mention, that I have seen in two or three cases great relief from pain experienced by the repeated application of three or four or more leeches over the region of the heart, followed by a blister. In one case, which I saw with Mr. James W. Illott, of Bromley, some short time ago, attacks of distressing angina ceased for several months, (when the patient died of another disease), after the application of leeches three or four times, and the internal use of iron. Exercise has recently been recommended in the treatment of these affections. The patients cannot take it, if it were desirable that they should do so. If exercise can be taken in the early stages of the disease, it should always be short of producing fatigue.

It may well be borne in mind, that narcotics are given with risk in these cases. One death occurred after an accustomed dose of morphia; another during the inhalation of chloroform. On the other hand, it is needless to indicate the usefulness of antispasmodics in these cases during paroxysmal attacks.—*Medico-Chirurgical Transactions, Vol.* XXIII., *p.* 121.

26.—PRACTICAL REMARKS ON DISEASE OF THE HEART, AND THE DROPSY FOLLOWING IT.

By Dr. Alexander Kilgour, one of the Physicians to the Aberdeen Infirmary.

[Dr. Kilgour states that his conviction, many years ago, was, that those who explained every thing on mechanical principles were apt to refine a little too much, and lay too great stress on a diagnosis, from the abnormal sounds of the heart alone. Nearly seven years' experience, he says, has confirmed him in this opinion, and he only allows that we may often make a pretty good *guess* as to the seat of the disease, but that is nearly all. As an easy mode of impressing in the mind the usual views or guesses, as to the seat of the morbid sounds of the heart, and probable condition of the parts causing them, Dr. Kilgour has drawn up the following diagram (see next page):]

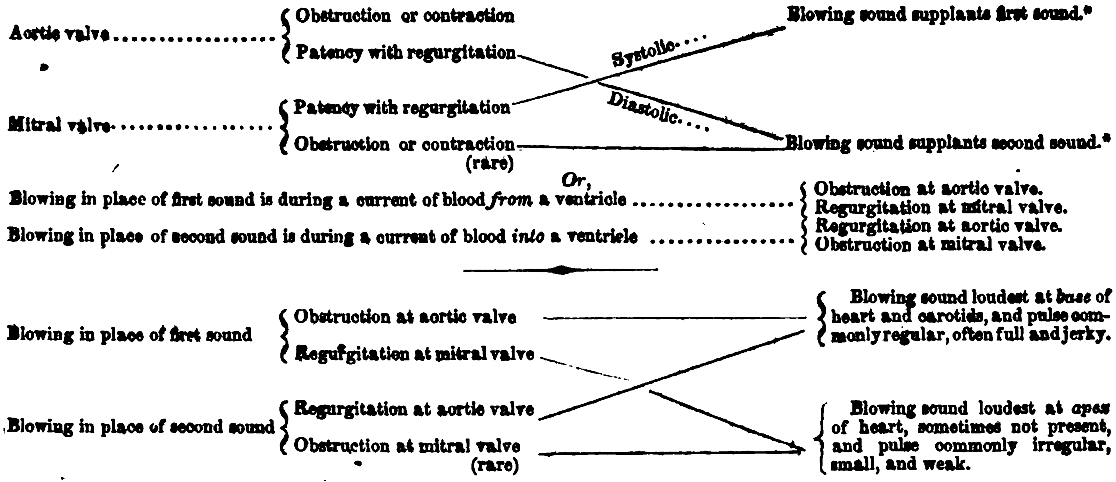
It will be observed that the second form of the diagram is merely another way, so to speak, of stating the same thing as in the first one. But the third is essentially different in its object, having reference to another sign than that depending upon the sounds. Perhaps some will object to the indications derived from the pulse, as not being deserving of so much importance as I am inclined here to attribute to them. I give them, however, only as farther aids to our guesses as to the true seat of the disease; and I must say, for my own part, that, having satisfied myself by my ear, and by such signs and symptoms from the condition of other organs as I can get, that heart disease does exist, I rely more on the state of the pulse than on anything else as a guide to the exact seat of the lesion.

When so much has been written on the treatment of the diseases of the heart, it may be something like going over a more than twice-told tale to offer any remarks on that subject. I shall, however, be brief, and the want of novelty will perhaps be atoned for by the fact, that I speak from the results of considerable experience, and that I offer these observations to the young practitioner chiefly.

If any one were to ask me "What can you do to cure disease of the heart?"—I would honestly answer at once, "Nothing." But if any one were to ask "What can you do to ward off the symptoms or feelings that too often become concomitants of that disease?"—I would say that, next to quietness of mind and body, and equable temperature, or moderate or rather low living, I know nothing equal to the use of small doses of colchicum wine, weak saline purges, and inserting a seton over the region of the heart. It will not do to trust to these when the severe sequelæ of heart disease—distressing dyspnœa, hæmoptysis, or dropsy—have more than once occurred; but I know no means equal to them in warding off these latter. I could mention several instances where this treatment has proved most beneficial. One case has been repeatedly under my notice. It was a female, a servant, past the middle period of life, who applied first for a slight attack of anasarca, arising from heart disease. The effusion was soon removed, and she was sent out of hospital with a seton in the side. She kept it open for some time; but thinking herself well, withdrew it. In a few days after she returned, begging that it might be re-opened,—which was done; and painful experience has more than once taught this woman, in the course of eight years, the necessity of keeping up a discharge from a seton, renewed when necessary, and aiding its influence by the occasional use of the above medicines.

It has often been doubted whether blood should be abstracted in cases of advanced heart disease in elderly persons, when labouring under a sudden paroxysm of violent dyspnœa giving the feeling of almost immediate suffocation.

DR. KILGOUR'S DIAGRAM OF MORBID SOUNDS OF THE HEART.



Aortic valve.................. { Obstruction or contraction
Patency with regurgitation }

Mitral valve.................. { Patency with regurgitation
Obstruction or contraction }
(rare)

Blowing sound supplants first sound.*

Blowing sound supplants second sound.*

Or,

Blowing in place of first sound is during a current of blood *from* a ventricle .... { Obstruction at aortic valve.
Regurgitation at mitral valve. }

Blowing in place of second sound is during a current of blood *into* a ventricle .... { Regurgitation at aortic valve.
Obstruction at mitral valve. }

Blowing in place of first sound { Obstruction at aortic valve
Regurgitation at mitral valve }

Blowing in place of second sound { Regurgitation at aortic valve
Obstruction at mitral valve }
(rare)

{ Blowing sound loudest at *base* of heart and carotids, and pulse commonly regular, often full and jerky. }

{ Blowing sound loudest at *apex* of heart, sometimes not present, and pulse commonly irregular, small, and weak. }

Purring tremor (*fremissement*) is *felt* sometimes, in disease of the valves, by the hand laid over the heart.

Purring sound (*frottement*), or creaking, or see-sawing sound, is heard in disease of the pericardium.

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* Similar sounds arise from disease of the corresponding valves of the right side; but disease of the left is twenty times more frequent than of the right.

No doubt, mustard poultices over the heart, and the immersion of the feet and legs in hot water, holding some mustard in it, will give some relief; but no means will be found equal to abstracting a small quantity—from two to four ounces—of blood from the arm.

In the treatment of cardiac dropsy, every practitioner has his favourite remedy taken from the class chiefly of diuretics or purgatives, or both. Of the former, I have found the following combination the most efficient. It pumps the patient out, so to speak, sometimes in a few hours: and it often will do so in repeated attacks of the anasarca.

℞. Infusi digitalis, ℥iv.; acetatis potassæ, ʒij.; spiritus ætheris nitrosi, ʒij.; aquæ cassiæ, ℥iss. Capiat cochleare magnum quartâ quâque horâ.

At last there comes an attack in which this and other diuretics cease to act, and we must then fall back on purgatives. Of the latter, unquestionably the most powerful is elaterium. But there surely must be a very great diversity in the strength of this medicine. Some practitioners, from the days of Sydenham, and long before him, downwards, appear to have given it in the dose of two grains, or even more; but I have found a single pill, according to the following formula, generally very powerful:—

℞. Elaterii, gr. j.; extracti colocynthidis comp., ℈ijss.; extracti hyoscyami. gr. xij. M. Divide in pilulas xij. Capiat unam nocte maneque.

The great objection to the elaterium is the intense sickness, even in this small dose, produced by it. Do the large doses produce less sickness than the smaller? It may be so, but in the few instances in which I have tried large doses, the sickness was not less. Is there any mode by which this sickening property in this valuable medicine could be removed?

The combination of a bitter purgative with a saline one composed of the vegetable alkali and a vegetable acid, is in my experience much more efficient than any single purgative, or than a bitter with a salt formed of a mineral acid. The old compound powder of jalap is a well-known instance of a mixture of this kind, and is still one of our best purgatives in all dropsies where this class of medicines may be suitable. Ferriar used, as did also Home, a combination of half an ounce of the bitartrate of potass with two grains of gamboge. The infusion of senna with bitartrate of potass is also an old-fashioned and valuable remedy; but the insolubility of the salt is an impediment to the efficiency of this formula. The senna infusion with tartrate of potass, or with tartrate of potass and soda, is not liable to the same objection; and the advantage of the frequent use of this combination in cardiac disease having a tendency to dropsy, or in the dropsy itself attending that complaint, has been in my hands, and those of my brethren to whom I have recommended it, so unequivocal, that I can speak for it in the highest terms.

There comes a time in the treatment of this complaint when not only diuretics in all forms, but even purgatives, cease to remove or even to keep in check the anasarca. And this brings me to speak of another mode of treatment, which often proves palliative for a time,—viz., puncturing the lower extremities, and thereby draining off the fluid.

I do not, however, recommend it until all internal remedies have failed. I never have recourse to it till it has become, to use Mead's expression, "unica spes salutis; and I do not forget the qualification he makes, "et ea dubia." Still I am decidedly of opinion that, whether as a palliative or as a hope of cure, it deserves more notice than now-a-days it seems to me to get.

There are two modes, as stated above, in which the opening for draining off the fluid may be made,—either a puncture with the lancet, or with a good stout sewing needle. From a single puncture by the latter, a quantity of water will sometimes run out so as to pass through the bed in a few hours, and require to be collected in vessels placed below it.

Heberden has evidently seen the danger attending this mode of treatment, though he does not say specifically in what it lies. He tells us that the wounds are difficult to be healed: but that we need not fear. He also says they are "periculosa." Now the danger consists in the inflammation of an erysipelatous character, that not unfrequently takes place, extending up the limb, sometimes bringing on *sphacelation*, and for the most part ending in the death of the patient.

But if the medical attendant would be satisfied with one incision and one, or at most two, punctures, in the proper place, erysipelas is not so apt to occur. The state of the skin—its low vitality during the existence of the dropsy under it—is singularly favourable for this form of inflammation; but a small clean cut, or one or two punctures,—and, if there be two, at a distance of not less than two inches from each other,—is not so likely to be followed by this as when, in the anxiety to get the water all off speedily, several have been made. The writers whom I have quoted all recommend fomentations to be applied to the wound; but I have often found the evaporating lotion very successful in keeping down any disposition in the part to erysipelas. Frequent ablution also with tepid water, and the removal of any cloths that may be soaked with the serum that has run out, will serve to prevent, so far, any irritation from being set up in the skin.

When the operation, even with a needle, has to be often repeated, as is sometimes the case, for the ease of the patient, especially in cardiac dropsy, there is sometimes a degree of inflammatory action set up in the cellular tissue by which its interstices become obliterated, and the skin and it become quite closely adherent to the fascia below. I remember this occurring in a gentleman, who had been kept alive for some months by punctures, and who was at last dropsical everywhere, except below the knees, where the adherent and thickened integuments would not distend,—thus giving him, however, not a little pain. It has of late been recommended to have recourse to this treatment much earlier in the disease than was the custom with the old practitioners; and it has been said that the chances of success from it are much greater than when the patient's strength has been exhausted, and the vitality of the skin has been impaired by the long existence of a dropsical effusion. This reasoning is fair; but whilst admitting it, one practical point may be mentioned, which is, that the fluid does not flow so freely from the incisions as when the areolar tissue has become more open and less resilient by the long existent pressure of the effused serum. And little as the danger of erysipelatous attacks may be from puncture of the skin in the early stage of anasarca, still there are few that will subject the patient to this chance of danger until all the other more usual and often successful modes of treatment have been tried in vain.—*Monthly Journal of Med. Science, Sept.*, 1850, *p.* 193.

27.—CARDIAC DROPSY.

By Dr. R. B. Todd, F. R. S., Physician to King's College Hospital. (Reported by Mr. H. H. Salter, B.A.)

[In this case, the patient, Alfred Baylis, aged 30, was admitted on the 11th of November, suffering from palpitation, shortness of breath, and emaciation, occurring after an attack of hæmoptysis. On the occurrence of another severe attack of hæmoptysis, orthopnœa supervened. He also suffered under amaurosis—varying with the palpitation of the heart—the blood having become so poor that the impairment of the quality caused any slight deficiency in the quantity sent to an organ, from inefficient action of the heart, to be felt by it more readily than if the blood were in its normal state. Dr. Todd has also seen this state in connection with enlarged thyroid gland, and particularly in women. The only thing explaining the existence of this cardiac disease, was, that the patient, at the age of 19, suffered a slight attack of rheumatism.]

His state on admission into the hospital was as follows:—Great exsanguineousness; breathlessness, particularly orthopnœa. Heart's action natural and regular, with no preternatural impulse; pulse 84, small, regular. There was an unnatural extent of dulness over the region of the heart, and moreover the pulsations of the heart were visible and sensible in the region of the scrobiculus cordis; they were felt also in the cardiac region. In some cases the heart's action is felt only in the scrobiculus cordis, and beneath the left mamma; and in such there is no evidence of enlargement; for there may be, and probably is, some cause pressing the heart to the right side, so that the altered seat of the pulsations is due to change in the position of the entire organ. But when the pulsation of the heart is felt in both regions we have evidence of enlargement, and of its being, at least the right ventricle that is enlarged; for while the left remains stationary in its normal situation, the right has passed over still further to the right side. Those of you who accompany me regularly through the wards of the hospital may notice, that in all cases of dyspnœa I make it a rule to place my hand over the scrobiculus cordis to feel if I can detect any cardiac pulsations there. My attention is particularly directed to this point in cases of long-standing asthma, and rarely in these cases do I fail to find it; never, indeed, if the asthma have produced emphysema, where there is not only displacement of the right ventricle by hypertrophy, but a pushing of the whole heart to the right side from the enlargement of the lungs.

We noticed also in this case a friction sound accompanying the systole and diastole, heard below and to the left of the nipple, and very circumscribed in extent. There was no bellows murmur either at base or apex; but we observed a phenomenon, connected in its indications with the beating of the heart, in the scrobiculus cordis,—viz., venous pulsation in the neck. This man has very large jugulars, and you may see them pulsating distinctly even at some distance from the bed. This phenomenon, as you know, is due to a reflux of blood at the systole from the ventricle through the auricle into the venous system. In consequence of the obstruction in the lungs the ventricle cannot completely empty itself, and so becoming distended the tricuspid valve allows some of the blood to regurgitate, and thus to escape through the auricle into the veins. The proper source of supply to these veins is from their distal extremity. If then you put your finger in the course of that supply,—that is, to the distal point where the pulsation is observed,—the vein would, if healthy, become empty; but it does not: it continues full, and its pulsations persist: hence the waves of blood which produce the phenomenon of pulsation must be propagated from the cardiac extremity of the vein.

There are many cases of heart affection where there are no pulsations, but where the vein does not empty itself on the cardiac side of the point pressed. Now in such cases there is regurgitation, but not to a sufficient degree to cause the pulsation. In perfect health the vein will be quite empty below the point pressed; but it is possible that a slight enlargement may suffice to produce the opposite state; and it is very possible that, even in health, it may exist to a slight extent under the prolonged though temporary occurrence of some disturbing circumstances, such as great efforts, violent actions, &c. When the regurgitation exists in a great degree, you may see all the superficial veins of the neck and chest pulsating.

We found also in this case evidence of great pulmonary congestion, crepitus and rhonchus being heard over various parts of the chest; and there was abdominal dropsy, caused by obstructed circulation through the liver. On examining the urine we found it acid, of specific gravity 1015, and heat and nitric acid gave evidence of the existence of albumen. When the fresh urine was allowed to stand, a scanty and flocculent deposit was formed, which, under the microscope, was found to consist of blood-corpuscles, epithelium (chiefly renal) a few pus globules, and a great many casts, for the most part granular and transparent, some containing cells loaded with oil globules; but these were not very abundant. Now this is a state of things which we should fancy our patient would not be likely long to survive: yet here we see him remaining very much in *statu quo*, if anything a little improved, until the present time, Jan. 16th, a space of two months.

Diagnosis.—Now can we, from these general symptoms, make a diagnosis without reference to the physical signs? I think we can form a diagnosis which shall be sufficient for all practical purposes; and I recommend you, as an important exercise, to endeavour to diagnose from symptoms before you have recourse to auscultation; because by so doing your attention will be directed to the disturbed *functions*, and you will thus receive important suggestions for treatment. Those who direct their attention exclusively to physical signs are apt to overlook these derangements of functions, and therefore miss some valuable indications of treatment corrective of them.

Now if I were to proceed on the data afforded by the *general* sypmtoms alone in this case, I should diagnose first, *dilatation of the right side of the heart;* the pulsation of the jugulars, and the beating of the heart in the scrobiculus cordis both indicate this. The pulsation of the jugulars, if proved to be regurgitant, is conclusive evidence of dilatation of the right ventrical: no other condition of heart is capable of producing this phenomenon. But we must be careful to prove that the venous pulsation is regurgitant, as it may be due to other causes: It may depend on the impulse of the heart being transmitted through the capillaries; or it may depend on the contiguity of a large artery which communicates its pulsations to the adjacent vein; therefore we must be careful in proving its nature before we attach importance to its indications. Now by making pressure on the vein we obtain sufficiently conclusive evidence as to the nature of the pulsation. If the vein empty itself on the cardiac side of the point pressed, and yet the pulsation continues in the empty portion of it, we know it arises, with the highest probability, from some contiguous artery; and this conclusion is rendered certain if the pulsation ceases on stopping the circulation in the artery. If, on making pressure, the pulsation continues only on the distal side of the point pressed, we may infer that the pulsation is due to the transmission of the pulse from the heart throughout the circulation, and especially if it be perfectly synchronous with the heart. But if the vein continues full between the point pressed and the heart, then we know, whether there be pulsation or not, that that vein must receive blood from its cardiac side, and this it can only do by regurgitation from the right side of the heart.

You are doubtless aware that a slight regurgitation always takes place from the auricles into the veins in the normal state, and that that regurgitation is synchronous with the auricular systole. But when the ventricle and auricle are dilated, the amount of regurgitation is increased in proportion to the degree of dilatation of the cavities: blood regurgitates from the ventricle into the auricle, and from the auricle into the veins.

The beating of the heart in the scrobiculus cordis is also indicative of dilatation of the right ventricle, because by its dilatation that cavity extends to the apex, and the apex thus enlarged extends to the scrobiculus. But, before we can affirm that the beating of the heart in the scrobiculus is due to the dilatation of the ventricle, we must be careful to ascertain that there is no displacement of the heart, which may be easily determined by seeing that its impulse is felt in the normal, *as well as* in the abnormal region.

So far, then, we may affirm, that there is dilatation of the right side of the heart. But such a lesion as dilatation does not arise spontaneously. There must be some dilating force, and that force is the backward pressure of the blood. When the muscular tissue of the heart is in a weak state, we can conceive that the walls of the ventricle may yield readily, without supposing any great increase in the ordinary pressure of the blood. But, in general, dilatation arises from some obstacle to the flow of blood from the ventricle; and in proportion to the resistance which that obstacle affords will be the backward pressure of the blood on the surface of the ventricle,—in other words, the amount of obstacle will give the amount of dilating force. In every case of dilatation of one of the heart's cavities, then, you must look for this dilating force,—this obstacle; and you will find it either at the orifice through which the cavity expels its blood, or in the arteries, or in the capillaries of some important organ, or in some defect in the valves or the orifices of the heart. Dilatation of the right cavities of the heart rarely arises from diseases of their own orifices; for obstructive disease of these orifices is amongst the rarest of cardiac lesions. Experience tell us that the obstructions which the right ventricle has to encounter are either from the circulation through the lungs, or from some derangement of the circulation through the left side of the heart.

And there is another cause which may produce dilatation as well as hypertrophy of the right ventricle, because it may produce the same change in all the cavities of the heart; that is, extensive or universal adhesion of the opposed surfaces of the pericardium. How it happens that obliteration of the pericardial sac can produce these changes, I do not attempt to explain; but that it does so there can be no doubt.

Let us now inquire what may cause a dilated right ventricle in this case. I have said that the most common causes of dilatation of the right ventricle are obstructed pulmonary circulation, or obstructed circulation through the left side of the heart. The most common causes of obstructed pulmonary circulation are the asthmatic state, or that which is a frequent consequence of the asthmatic state—emphysema of the lungs. We have no indications in this case of either of these conditions. The history of the patient shows the absence of the one, and the physical signs demonstrate the absence of the other. Is there, then, any disease of the left side of the heart sufficient to create this dilatation?

When I saw the patient first I hazarded a guess, from the character of the pulse, that there was *mitral* disease at the foundation of his malady. The peculiarity of the pulse which suggested this notion was, that it was small, produced by a small stream, apparently inadequate to the size of the artery, and not proportioned to the action of the heart. Such a state of pulse does frequently co-exist with mitral disease; but so various are the conditions capable of producing a small feeble pulse, that a diagnosis based upon that sign only must necessarily be only a guess. Now such mitral disease might be either *regurgitant or obstructive*—either of the two would affect the right side of the heart. And how?—By affording an obstacle to the return of the blood from the lungs. Whether the blood is unable to advance in consequence of a *contracted* mitral orifice, or whether it flows back in large quantity into the auricle, it is evident that an impediment is offered to its passage from auricle to ventricle, and, therefore, to its return from the lungs to the auricle; and when this has continued for some time, the right ventricle being exposed to a degree of pressure greater than customary, yields, and gradually expands, till at length it assumes a permanently dilated state.

Now, is the disease here regurgitant or obstructive? The dyspnœa favours the idea that it is obstructive, because there is no form of heart disease in which the dyspnœa is so great as in obstruction at the mitral valve. Very often, when the disease is of this nature, sudden and terrible dyspnœa is the first evidence of its existence; the patient is suddenly awoke out of sleep by a breathlessness that seems as if it would kill him: he starts up in bed and gasps for breath till the paroxysm gradually subsides. Such a first attack is generally the precursor of similar ones, increasing in severity and frequency, only kept off by constant watching and the upright position. till at length the dyspnœa becomes constant, and the case terminates with pulmonary apoplexy.

But in the absence of this disease of the mitral valves, is there any other way of explaining the occurrence of the dilatation of the right cavities of the heart? The only explanation I can offer is that there is hypertrophy and dilatation of the left cavities connected with obstruction in some part of the systemic circulation, in the aorta or in the renal circulation, or dependent on adherent pericardium, and that this state of the left cavities obstructs the circulation through the right cavities, and causes dilatation and hypertrophy of them.

So far, then, for the indications afforded by the general symptoms: let us now turn to—

The physical signs.—A careful observation of the physical signs will serve to confirm or correct our inferences from the symptoms, and help us to adopt a more decided diagnosis. The physical signs themselves were these: extensive dulness over the præcordial region, indicating enlargement of the heart; the first and second sounds were found to be essentially healthy, and unaccompanied with bellows murmur, as well at the base as at the apex. The absence of bruit at the base shows that there is *no* aortic disease; also its non-existence at the apex shows that there is no *regurgitant* mitral disease: for if there were, we should inevitably hear a systolic bellows murmur in this situation—*i. e.*, unless the heart's action were very weak: it is only in a state of great feebleness of the ventricular contraction that there would be no bellows sound where there is mitral regurgitation; but with our patient the heart's action is not at all feeble. Now, is there any diastolic bellows sound to indicate obstruction at the mitral orifice? We find none. Are we, then, justified in denying the disease of the mitral valve? Certainly we are not, for those cases of unquestionable obstructive mitral disease in which a diastolic murmur is heard are comparatively few: there must be a certain amount of force in the auricle for its production, and unless this exists the sound will not be heard. The value of this evidence, therefore, is merely negative: it does not prove that there is no obstruction at the mitral orifice, but only that the impulse given to the blood by the auricle is not sufficient to elicit a sound from the existing obstruction. So far, then, we receive really no aid as to determining the question of the existence of obstructive mitral disease from examining the sounds of the heart. We know, however, that there is no mitral regurgitation; and, as to the question of mitral obstruction, we have no further evidence than what the symptoms give us.

This evidence is undoubted as to the existence of obstruction; but it is not sufficient to determine the exact seat or nature of the obstruction. By the aid of auscultation we can determine that it is not mitral regurgitation: it may, however, arise from contraction of the mitral orifice, or from that general obstruction which the left heart has to encounter in the distal part of the systemic circulation.

Taking it for granted, then, that the circulation through the left side of the heart is obstructed, it is easy to explain all the other symptoms. The obstruction through the left side of the heart throws the blood back on the left auricle, and thence on the lungs, giving rise to the state of extreme pulmonary congestion in which we find our patient, and the consequent hæmoptysis. The obstruction at the lungs is felt by the right ventricle, which, in its efforts to overcome the opposing obstacle, becomes dilated and hypertrophied: the right auricle encounters corresponding difficulties to those which oppose the action of the ventricle, and it becomes similarly dilated and hypertrophied; and, in consequence of the impediment which it has to encounter, the blood is thrown back upon and delayed in the venous system, and regurgitant venous pulsation and dropsy are the result. Thus we see all the symptoms fall in a retrograde succession as the consequences of the obstructive force beginning at the left side of the heart, or in some part of the systemic circulation.

A feature of this case which practically is of most interest to us is the *dropsy*, because this is the symptom which generally and justly excites the most alarm in the minds of patients and their friends. I have already mentioned that the characteristic of cardiac dropsy is this, that it always takes place in the most dependent parts: it does not begin, as we have seen other forms of dropsy, in the face and upper extremities. An aneurism may cause dropsy of the upper parts of the body from pressure on the descending cava or some of its large tributary veins, but pure cardiac dropsy never comes on thus: the very fact of its not existing in the upper parts of the body indicates its cardiac nature. We find it apt to vary in amount according to position; the erect or sitting posture favours its accumulation, and hence we find it in increased quantity towards the end of the day, and disappearing or diminishing in the morning from the recumbent position during the night. Still it *will* appear in the upper extremities, but always late, and often more on one side than another, being most abundant on that side which is the most dependent. This we have seen in our patient: his left hand was the first affected; but lately we find he has been lying very much on his right side, and the consequence is that the dropsy has left his left hand, and accumulated in his right. We could not have a better proof than this of the purely mechanical character of the effusion.

Now what is the immediate cause of this dropsy? We have seen that the obstructing force extends from the left to the right side of the heart, and by its influence in the latter situation a considerable portion of the blood returning from the general circulation is pumped back into the veins at every systole: this obstructs the flow of venous blood throughout the body: the circulation is consequently impeded in the capillaries: these vessels become loaded, and the only relief they can obtain is by the filtration of the serum of the blood, or the liquor sanguinis, into the areolar tissue. If any part is dependent, a greater force is needed to send the blood through its capillaries, because the venous blood has to ascend against gravity: a greater accumulation is apt to take place both in the capillaries and veins: and, therefore, such part becomes affected with a greater amount of dropsy.

The access of dropsy is always a serious symptom, but not necessarily a fatal one. It may come on early or late. In some cases of purely cardiac disease in young persons, not complicated with either kidney or liver disease, dropsy may come on early, from which the patient may recover completely, and life may be prolonged for some time even although the cardiac disease continue. Suppose a patient has had rheumatic endorcarditis, and that the impairment of the mitral valve gives rise to regurgitation, the effect would be to obstruct the circulation first at the left, and then at the right side of the heart. Now the right cavities feel the obstruction at first much more than they would do afterwards: the left auricle, being slow to dilate, has not yet adapted itself to the deranged condition, and the whole force of the obstruction is thrown back on the lungs and on the right side, the cavities of which dilate easily, and you get rapid dropsy. In the meantime the left auricle dilates, the circulation through the lungs becomes less obstructed: there is, therefore, less obstruction in the right side of the heart: it gradually recovers itself, and the dropsy diminishes.

In all cases what seems to be necessary to the production of the dropsy is the *dilatation of the right side of the heart.* I think my friend Dr. Blackiston, of St. Leonard's, was the first to point out clearly the importance of this condition. Dr. Blackiston seems to lay it down as a rule that venous regurgitation always precedes the dropsy. But dilatation may exist without regurgitation being manifest in the external veins: at least, I think that the regurgitation need not exist to such a degree as to produce pulsation. I am now attending a case in private practice, in which there is dropsy and undoubted dilatation of the right side of the heart, but no venous pulsation.

But there are certain other circumstances in this case, in addition to the condition of the heart, that predispose to dropsy: these are, a state of the blood in which the water is in large proportion, and its solid ingredients defective, and *renal disease.* When the blood is in such a condition as to favour dropsy, the other causes will act much more speedily than when such is not the case: and, no doubt, in the present instance, the dropsy came on much earlier in consequence of the impoverished state of the blood, occasioned by the repeated attacks of hæmoptysis which our patient had suffered.

Reviewing, then, the whole case, we may sum up thus: that the primary cardiac affection consisted in a rheumatic endocarditis, which narrowed the aperture of communication between the auricle and ventricle, and thus obstructed the passage of the blood into the ventricle, throwing it back upon the lungs, causing pulmonary hæmorrhage, and dilatation and hypertrophy of the right cavities; or, in a rheumatic pericarditis, causing an extensive adhesion between the heart and the pericardium, and so far impeding the heart's play as to give rise to hypertrophy with dilatation of its cavities. Or that, from some obstruction to the circulation, either in the large arteries, or in some more distant part of the circulation (in the kidney, for instance, from the chronic disease in that organ,) the left heart has suffered dilatation and some hypertrophy; and that, in course of time, the right heart has, in consequence of the obstructed circulation in the left side, become hypertrophied and dilated likewise. On the former supposition, the primary disease would be in the heart itself; on the latter, it would be in the kidneys, or some other part of the systemic circulation.

I have already alluded to the amaurosis with which our patient is affected. This affection most probably results from an anæmic state of the retina. Last summer we had in the hospital a remarkable case, which illustrated how loss of blood produced amaurosis. The man had suffered from violent hæmatemesis: after the last attack he completely lost his sight, and he remained quite blind afterwards, notwithstanding a variety of treatment to which he was subjected. In a case of this kind the nutrition of the retina is permanently damaged by the altered quality or quantity of the blood after such severe hæmorrhage, and it bears an analogy to those cases in which delirium or epilepsy follow excessive losses of blood, or extreme states of anæmia.

Treatment.—In the treatment of cases of this description your attention should be principally directed to the relief of the urgent symptoms, and to strengthen the power of the heart. For the relief of the dropsy a great deal may be done by attention to the position of the patient, and by the administration of diuretics. With the view of supporting his power we gave our patient Baylis tonics and iron: and, finding the kidneys acting imperfectly, we gave him digitalis. But in such cases it is desirable to be careful in administering this medicine, and it is a good plan to combine it with some tonic. I frequently combine it with ammonia, or give the tincture of digitalis with the tincture of muriate of iron. However, I cannot say that any great benefit resulted in the present case, either from the digitalis or the iron; that treatment was cut short by the supervention of the pericarditis. This, however, was subdued by very simple means—counter-irritation and copious discharge by the blister.

There was much difficulty in getting the kidneys to act, and the greatest benefit was derived from the bitartrate of potass, either alone or in combination with the pulvis jalapæ, or the compound powder of jalap. We also gave him lemon-juice, and found it acted freely on the kidneys for some time. The dose of lemon-juice was from half an ounce several times a day.

Elaterium was also given; but without any decided benefit. What, however, has served best to keep down the dropsy of the legs is the acupuncture; the quantity of water that has run away from him, and the relief that he has obtained from it, is surprising. In practising acupuncture in dropsical cases it is important that you should make the punctures at a considerable distance from each other, for each puncture is apt to become the centre of an erysipelatous inflammation, which spreads the more readily when the punctures are too near each other. Indeed, however you make the punctures, the difficulty which you have to encounter arises from this erysipelatous inflammation, which almost invariably follows sooner or later. There is another method of relieving anasarcous legs, lately proposed by Lombard, of Geneva. Instead of pricking the legs at various points with the needle, he advises to make a single incision above the malleolus, or in some other convenient position (not too near a vein or artery,) cutting through the skin and subcutaneous tissue down to the fascia. The length of the incision may be from half an inch to an inch, and the rapid flow of water that these incisions admit of is further encouraged by sitting the patient on the side of the bed for a certain time during the day with his feet placed in a tub. The patient has by this means the treble advantage of increased rapidity of the flux of the fluid, the prevention of that sloppy and soaking condition which inevitably ensues when the acupunctures are running all day, and the ease to the breath that results from the erect position. There is less danger of sloughing by this process, as a single incision is sufficient for each leg. Unhappily we can do nothing to restore the impaired action of the heart, but we may do much to ameliorate the condition that that impairment entails. The principal indications are to support the patient's strength, to keep open the emunctories, and to adopt all the means in our power to get rid of the superfluous water.—*Med. Gazette, Sept.* 20, 1850, *p.* 480.

28.—DISEASES OF THE HEART.

By Dr. O'Bryen Bellingham.

[The abnormal sounds of the heart were first termed murmurs by Dr. Forbes, but as they are in every instance the result of friction, they would be more completely classified according to their seat, those which have their seat external to the heart being termed pericarditic or exocardial, and those within the heart endocarditic or endocardial. The exocardial murmurs, however, are more particularly entitled to the term friction sounds, as they take place between two solids, for in all the others one of the agents producing the sound is a liquid. As in a state of health the opposed serous surfaces of the pericardium glide smoothly over each other without any perceptible sound, so, if by inflammation these surfaces should be rendered rough by deposition of lymph the friction then developes the sound, and even sufficiently strong to comm eate a distinct vibratory sensation to the hand, the sound varying in inte in proportion to the action of the heart, and the quantity of the deposit.

friction sounds of pericarditis may be included under the following heads;—1st, A slight friction sound. 2d, A rasping sound. 3d, The sound resembles "the creaking of new leather," as originally compared by M. Collin.]

Conclusions respecting the pericarditic friction-sounds.—1. That they are almost limited to cases of inflammation of the pericardium; that they are pathognomic of one form of this disease, and constitute the most valuable diagnostic signs of it. 2. That they have all, more or less, a friction or attrition character. 3. That they are almost always double, and are usually better marked during the period of the ventricular systole than during the diastole. 4. That they appear to be superficial and near, and are seldom audible much beyond the limits of the præcordial region. 5. That they do not, like the murmurs next to be described, replace the ordinary sounds of the heart, but are heard independent of them. 6. That their duration is usually short: frequently ceasing entirely after having been heard for a few days, and not unfrequently changing their character within the period that they are audible. 7. That they are frequently accompanied by a peculiar vibration or frémissement sensible to the hand laid upon the parietes. 8. That a bruit de soufflet at one of the orifices of the left side of the heart, the result of endocarditis, not unfrequently coincides with these sounds.

Endocardial or valvular murmurs.—The abnormal sounds which have their seat at the orifices of the ventricles, and which replace or accompany the normal sounds of the heart, constitute the most valuable sounds of disease of the valves or orifices of the left side of the organ. They present several varieties in different cases—being sometimes blowing, when they constitute the varieties of the bruit de soufflet or bellows murmur; sometimes rough and harsh, resembling the familiar sounds of sawing, rasping, or filing; and at other times having a whistling or musical character, constituting the varieties of the bruit de soufflet musicale, or musical murmur.

Bruit de soufflet.—The bruit de soufflet or bellows murmur, as the name denotes, has a blowing character, and is by many degrees the most frequent abnormal sound heard in diseased states of the valves or orifices of the heart. It was discovered and named so, by Laennec, from its similarity to this well-known sound, to which it often bears a most ridiculous resemblance. Bruit de soufflet does not always, however, present the same character: sometimes it is perfectly smooth and soft; at other times it is loud and rough; sometimes it is a mere whiff: at others it is prolonged and lengthened out. It may accompany or replace either the first or the second sound of the heart, more frequently the first; or it may pass into a sawing, rasping, or musical murmur. In the vast majority of cases of disease, it is limited to the left side of the heart.

Circumstances under which bruit de soufflet is heard.—Bruit de soufflet is heard in various and different lesions of the valves and orifices of the heart; it is not, however, limited to diseased states of this organ, but becomes audible under a variety of other circumstances, as we shall presently see. Thus, it is heard when there is any obstacle to the free passage of the blood through the orifices of the left side of the heart, or when the valves imperfectly perform their functions, and permit regurgitation. It is heard in aneurism of the left ventricle and in congenial malformations of the heart, where a communication exists between the ventricles. It is heard in cases where the lining membrane of the arch of the aorta is diseased, and in aneurism of all the large arteries. It is heard in aneurismal varix, where a communication exists between an artery and a vein, in varicose aneurism where a small sac exists between them, and in the pulsating form of aneurism by anastomosis. It is frequently heard in cases where no disease of any kind exists in the heart or arterial system, but where the quality of the blood is altered; where this fluid has become more watery and less viscid than natural. Finally, it can be developed at any time in the heart and arteries by suddenly abstracting a large quantity of blood, as was first pointed out by Dr. Marshall Hall; or in a large artery by making pressure upon it so as to diminish its calibre.

Bruit de soufflet may be developed in the cavity of the chest by the growth of a tumour of any kind, which comes to press upon the aorta or its branches, or upon the pulmonary artery; or by malformation or deformity of the chest, owing to disease of its bony parietes, by which the heart's movements are impeded or the large vessels are compressed. Bruit de soufflet is said to have sometimes been heard for the first time, a short period previous to death, in the advance stage of pulmonary or other diseases: M. Bouillaud refers it then to the formation of fibrinous concretions in the cavities of the heart, which interfere with the action of the valves, or obstruct the orifices. It is temporarily heard in violent palpitation in hysterical subjects, or in attacks of palpitation in cases where the left ventricle is hypertrophied, and its cavity dilated: here it disappears as the palpitation subsides. Bruit de soufflet, in a very marked form, is likewise heard from the fourth month to the end of pregnancy: here its site is usually the iliac fossa, sometimes on both sides, more frequently only on one side.

Dr. Graves has noticed the remarkable fact, that a bruit de soufflet is sometimes audible, in the second stage of pneumonia, over the affected lung, which disappears as the symptoms of the inflammation subside: it is not perceptible in the subclavian or carotid arteries of the same side, and probably, when present, depends upon pressure on the branches of the pulmonary artery. Dr. Latham has called attention to the circumstance that a gentle bruit de soufflet, which coincides with the ventricular systole, is heard occasionally in phthisis: it is not perceived in the præcordial region, but in a circumscribed space above it and on the left side. M. Zehetmayer has confirmed the correctness of Dr. Latham's observation, and would appear to have noticed this murmur previous to the publication of Dr. Latham's work. He says, "I have repeatedly heard, phthisical persons, in the second intercostal space, a decided bellows-murmur, instead of the first sound of the pulmonary artery; and in a place where there was no doubt that tubercular infiltration was present. No alteration in the vessel could be detected on post-mortem examination." Dr. Latham supposes that this murmur may have its cause in the pressure exercised by the diseased lung upon the pulmonary artery, and its first branches. In both the latter cases, the condensed lung, having become a better conductor of sound, conveys a murmur to the ear which would probably be inaudible if the lungs were healthy. M. Gendrin has called attention to the circumstance that, in the cold state of intermittent fever, a bruit de soufflet, analagous to that heard in cases of chlorosis, is audible on auscultation of the heart. As individuals who have been the subjects of ague for any length of time are, however, in general more or less anæmic, the murmur is probably due to this cause.

Conditions under which bruit de soufflet is developed.—Whenever bruit de soufflet is heard in the heart, it arises either from contraction or some other diseased state of the orifices or valves of the heart, which impedes the free passage of the blood; or from a condition of the valves which prevents them from closing the orifice, and permits regurgitation; or from the blood being impelled with increased force and velocity through the aortic orifice, or through an abnormal orifice, as in aneurism of the left ventricle, and congenital malformations of the heart; or from some alteration in the quality of the blood itself, or in its quantity; or from the formation of fibrinous or other concretions in the cavities of the heart, which interrupt the play of the valves, or impede the orifices; or where morbid growths are developed in the cavity of the chest, which compress or displace the heart; or where the bony walls of the thorax are deformed, and the cavity is much narrowed.

Whenever bruit de soufflet is audible in the arteries, it arises either from roughness of the lining membrane of the vessel; or from the calibre of the artery being diminished, owing to pressure upon the part; or from an altered condition of the blood; or from an aneurismal sac springing from a large artery; or where an abnormal communication exists between a large artery and a vein; or where an aneurismal sac is seated between an artery and a vein, through which the blood passes from one to the other.

[The increased friction between the blood and the parts along or through which it passes is the physical agent producing the bruit de soufflet, and this appears to be amply sufficient not only to develope murmurs, but to convert the normal sounds of the heart into them. Thus—]

1. **When the orifice of the aorta is contracted, or its valves are diseased, so as to impede the direct passage of the blood, there must necessarily be increase**

of friction; and the normal first sound of the heart will be converted into a murmur.. 2. When the mitral valve is diseased, and permits a refluent current of blood into the left auricle at each ventricular systole, a murmur will be developed, which, from its louder tone, will obscure or render inaudible the first sound of the heart. 3. When the similunar valves of the aorta imperfectly close the orifice, the blood must regurgitate from the aorta into the left ventricle at each ventricular diastole; and that this occurs with sufficient force to generate a murmur, which obscures or renders inaudible the normal second sound of the heart, is well known. 4. When the left auriculo ventricular orifice becomes dilated, and the valve cannot, from this cause, fulfil its function perfectly, regurgitation of the blood occurs at each ventricular systole, and a bruit de soufflet is developed, which is usually sufficiently strong to obscure the normal first sound of the heart. 5. When the blood is propelled with greatly augmented force, and with increased velocity, through the aortic orifice, the amount of friction between the blood and the parietes of this orifice must be much increased; and if it is sufficiently strong to generate a murmur, this will have the characters of bruit de soufflet, and will take the place of the normal first sound of the heart. 6. When the lining membrane of the ascending portion of the arch of the aorta loses its natural smoothness and polish, the friction between the blood and the part along which it passes must be increased; and, if the heart's action is strong, a murmur will be developed, which will be synchronous with the first sound of the heart, and will often be audible in the large vessels which come off from the arch of the aorta. 7. When the viscidity of the blood is diminished, and its watery parts are increased, a greater amount of friction will take place between this fluid and the orifice of the aorta, in its passage out of the ventricle, as well as in the large arteries, which is usually quite sufficient to convert the normal first sound of the heart into a murmur. 8. When the blood is propelled into an abnormal cavity, or through a preternatural orifice, and the action of the left ventricle is strong, the friction will be sufficient to generate a murmur which will obscure the first sound of the heart. 9. When the large arteries in the cavity of the thorax are compressed by the growth of a tumour within, or by deformity of the bony cavities from disease without, the diminution of their calibre is often sufficient to generate a murmur, which will have the character of bruit de soufflet, and will be heard at the period of the ventricular systole. 10. When lymph is deposited about the valves or orifices of the heart in sufficient quantity to prevent the action of the valves, or to obstruct the passage of the blood, there will necessarily be increased friction, usually sufficient to develope a murmur which may replace either the first or the second sound of the heart, or both. 11. When the fibrin separates, in the cavities of the heart, from the other constituents of the blood, and obstructs the orifices or impedes the action of the valves, if the action of the heart was strong sufficient friction would be produced to develope a murmur; but as this scarcely ever occurs, except during the last few hours or days of life, the current of blood is generally too feeble to develope a murmur. 12. The bruit de soufflet heard after the fourth month of pregnancy, which is not audible until the uterus has risen out of the pelvis, and which is generally known under the name of the "placental soufflet," appears to have its cause in the pressure exercised by the enlarged uterus upon the iliac arteries. Because it always accompanies the ventricular systole, it is audible usually only in one iliac fossa: and an exactly similar murmur has been heard by Dr. Montgomery in cases where the uterus itself was enlarged from disease, or where an abdominal tumour compressed the aorta. In addition, M. Bouillaud has found that, by changing the position of the patient, the sight of the murmur is altered; and Dr. Cowan observes that the bruit de soufflet in these cases "can be detected in the femoral arteries immediately below the arch," and that "the sound may, by change of position, be transferred from one femoral artery to the other; always corresponding with the side of the uterine murmur."

In the majority of the foregoing examples the bruit de soufflet is heard at the period of the ventricular systole, and replaces or accompanies the first sound of the heart: the force with which the blood is propelled by the left ventricle being much greater than that with which it enters it, the friction between the blood and the parts along or through which it passes must be much more considerable in the former than the latter. In the former it is generally sufficient to generate a murmur, in the latter it only occasionally does so; and, when a murmur is developed, it has a different character. For instance, when the mitral valve or orifice is diseased, so as to permit regurgitation, a bruit de soufflet will be heard at the period of the ventricular systole, which quite obscures the normal first sound of the heart; when the aortic valves permit regurgitation, a bruit de soufflet is audible at the period of the ventricular diastole, which likewise obscures the normal second sound of the heart. But the two murmurs are very different: that which accompanies mitral regurgitation is loud, strong, and blowing; that which accompanies aortic regurgitation is soft, feeble, and whispering, because the force with which the blood is propelled out of the left ventricle is so much greater than that with which it enters the same ventricle.

Two or more of the conditions described above are not unfrequently combined in the same subject; and we may have a murmur taking the place of, or obscuring both sounds of the heart; or the bruit de soufflet may pass into a sawing, rasping, or musical murmur; or, finally, the valvular disease may be complicated with an anæmic state of the system, by which the difficulty of the diagnosis is sometimes considerably increased.

Bruit de soufflet at the right side of the heart.—The foregoing remarks have reference more particularly to the bruit de soufflet developed at the right side of the heart: in fact, this abnormal sound is very rare at the right side of the organ, because the force with which the blood enters or is expelled from the right ventricle is generally too feeble to generate a murmur; while valvular disease at this side of the heart is uncommon.

Dr. Clendinning has shown, from statistics in 100 cases, that valvular disease is sixteen times more frequent at the left than the right side of the heart. When we consider too, that in cases of anæmia the murmur is limited to the left side, and that murmurs from regurgitation are never, or scarcely ever, produced at the right side of the heart, we can understand why bruit de soufflet should be so rare at this side. For instance, mitral regurgitation is one of the most frequent causes of bruit de soufflet at the left side of the heart: on the other hand, tricuspid regurgitation is even more frequent; but it is not accompanied by any morbid sound, and is usually recognized by another sign, —viz., jugular pulsation. Again, aortic regurgitation is a frequent cause of a murmur at the left side of the heart, but a very uncommon cause of a murmur at the pulmonary orifice. "I believe (Dr. Hope observes) diastolic murmur of the pulmonic valves to be exceedingly rare from disease of the valves themselves, as I have never met with a case, or been able to find one recorded." "From a rude numerical calculation (he adds) deduced from the cases that I have seen, I should think that there would be at least thirty chances to one against a murmur connected with the semilunar valves being seated in the pulmonic set."

Conclusions from the presence of bruit de soufflet.—The value of bruit de soufflet as a sign of disease of the valves or orifices of the heart, depends—

1st. Upon the period of the heart's action at which it occurs. 2d. Upon the situation at which it is best marked. 3d. Upon its character or tone. 4th. Upon its being constantly present or not.

In organic disease of the valves and orifices of the heart, bruit de soufflet is in a great measure limited to the left side of the organ, and has its seat either at the aortic or mitral orifice. When it replaces the first sound of the heart, it depends, in almost all cases, either upon obstructive disease of the aortic orifice, or regurgitant disease of the mitral orifice. When it occurs at the period of the ventricular diastole, and of the second sound of the heart, it almost always has its cause in a state of the aortic valves permitting regurgitation. When bruit de soufflet accompanies both the systole and the diastole of the ventricles, it may have its cause either in obstructive disease of the aortic orifice, combined with a state of its valves permitting regurgitation; or in the mitral and aortic valves, both permitting regurgitation.

The first sound of the heart is not unfrequently replaced by bruit de soufflet, when no disease of the valves or orifices exists; but a murmur is never heard at the period of the second sound of the heart, unless in cases of disease. A murmur at the right side of the heart is, as has already been observed, extremely rare; and, when it is heard, it will be found to depend more frequently upon disease of other parts than of the valves or orifices of the right ventricle.

[With regard to the so-called sawing, filing, and grating valvular murmurs. Dr. Bellingham remarks:]

It is a common opinion that the harsh grating valvular murmurs are the result of osseous or calcareous degeneration of the valve at which they have their seat, and that they always indicate a more advanced state of disease of the valves, or a greater amount of contraction of the orifice than bruit de soufflet. This was the opinion of Laennec, and this appears to be the view taken by M. Bouillaud; it is far, however, from being correct: these sounds are heard in cases where the valves have undergone neither calcareous nor osseous degeneration; and a very advanced state of disease of a valve is often indicated simply by bruit de soufflet, while, in the most advanced stage of all, it may disappear, and no murmur of any kind be audible. This is sometimes witnessed at the mitral orifice, when the contraction becomes so extreme as not to permit a sufficient current of refluent blood through it to develope a murmur.

Although these harsh grating sounds do not necessarily indicate either osseous or cartilaginous degeneration of the valves, and are often not heard in cases where valvular disease is much advanced; yet, when they are well marked, we may conclude that the degree of friction between the blood and parietes of the orifice at which they are developed, is greater than where simply bruit de soufflet is heard. In the majority of cases this is owing to hypertrophy, or hypertrophy with some dilation of the ventricle complicating the valvular disease, by which the contractile power of the ventricle is increased, and the blood is transmitted with augmented force through the diseased orifice. Hence the rough valvular murmurs are limited in a great measure to the period of the ventricular systole and the first sound of the heart, and are not heard in inorganic affections of the organ, in which bruit de soufflet is so common.

In almost every instance the rough grating murmurs are preceded by bruit de soufflet; the one insensibly passes into the other; and the former are to be regarded as merely more intense degrees of the latter. For instance, when, owing to the disease of the semilunar valves of the aorta, or of the aortic orifice itself, the passage outwards of the blood is obstructed, a bruit de soufflet will be developed: if the impediment increases, owing to increase of the obstruction, and if, as usually occurs, the parietes of the left ventricle become hypertrophied, —the bruit de soufflet will pass into a sawing, filing, or rasping murmur. On the other hand, when the aortic valves merely permit regurgitation, no increase of the disease will convert the bruit de soufflet into a rough or grating murmur, —because the force with which the current of blood enters the ventricle is never sufficiently great to develope a harsher sound than bruit de soufflet. The rough grating valvular murmurs are consequently limited to the period of the ventricular systole; they replace only the first sound of the heart, and are, in a great measure, limited to disease of the aortic orifice or its valves.

Conclusions from the presence of a Rough Valvular Murmur.—1. The sawing, filing, grating and valvular murmurs are to be regarded as nothing more than bruit de soufflet exaggerated. 2. They are limited to the period of the first sound of the heart, and accompany only the systole of the left ventricle. 3. They are only heard in cases of organic disease of the valves or orifices. 4. The diseased state in which they are most generally audible is narrowing of the aortic orifice. 5. In almost every instance, hypertrophy, with dilatation of the left ventricle, accompanies the valvular disease. 6. The sawing, filing, and grating valvular murmurs do not necessarily indicate either osseous, calcareous, or cartilaginous degeneration of the valves or orifices.

The abnormal sound heard most frequently in the arteries is bruit de soufflet. In a state of health, the blood, in its passage through the large arteries, causes such slight friction that very little sound is produced; this is short, single, and repeated at equal intervals, from sixty to eighty times in a minute, and is synchronous with the ventricular systole, and with the pulse. If slight pressure be made upon the vessel with the finger, or with the stethoscope, this sound increases in intensity; and if the pressure be increased, it is converted into a murmur, having the character of bruit de soufflet. Increase of friction between the blood and the lining membrane of a healthy vessel, produced by merely diminishing the channel through which the current flows, is therefore sufficient to produce a murmur in a large artery.

Again, one of the most important properties of the blood is its viscidity. In some morbid conditions of the system this property is impaired; the blood becomes impoverished, attenuated, and watery; the red globules diminish; serum superabounds; and, as a natural consequence, the viscidity of this fluid is less than natural. In other cases the actual amount of blood in the system is diminished, as after profuse hæmorrhage, or when venesection has been carried to an extreme degree. In both these cases, the amount of friction between the blood and the lining membrane of the arteries must necessarily be greater than natural; and this increased friction is capable of developing a murmur analogous to the bruit de soufflet produced by pressure upon a healthy vessel. In order that the murmur may be well marked, it is necessary that a certain degree of velocity of the current above the natural standard should occur in addition.

The arteries in which bruit de soufflet is most commonly heard are the aorta, the carotids and subclavians, the iliac and femoral arteries. It may be heard in any one, or in all these vessels, when the blood is propelled with increased force and velocity through them; or when the calibre of the artery is diminished by pressure from without; or when the coats of the arteries have lost their natural and healthy state of tension; or when the blood is more or less attenuated, owing to its watery parts being increased, and the red globules diminished,—the result of profuse hemorrhage, or of a chlorotic state of the system. The latter are frequently accompanied by the abnormal sounds (presently to be described) which have their seat in the veins; in these, also, the action of the heart is more rapid than natural; and the arterial bruit de soufflet is sometimes accompanied by a murmur at the aortic orifice, depending upon the same cause.

The bruit de soufflet, which has its seat in the large arteries, has been mistaken for a valvular murmur, particularly when it has its seat in the arch of the aorta, or in the carotid and subclavian arteries. It may almost always be distinguished,—

1. By its character, which, as Dr. Hope observes, is "usually a mere whiff." 2. By its never being heard at the period of the ventricular disatole and the second sound of the heart. 3. By its being usually audible over several arteries at the same time. 4. By the facility with which the murmur is altered by varying the amount of pressure of the stethoscope, by which it is converted into a hissing, or harsh murmur. 5. By its not being constantly present; by its subsiding occasionally when the circulation becomes tranquil, and returning when palpitation ensues. 6. By the general signs of anæmia being present. 7. By the absence of the physical or general signs of organic disease of the heart. 8. By its entirely disappearing under treatment calculated to relieve the anæmic state of the system.—*Medical Gazette, Sept.* 6, 1850, *p.* 397.

29.—SPECIAL RULES TO BE FOLLOWED DURING AUSCULTATION OF THE CIRCULATORY ORGANS.

By Professor BENNETT, Edinburgh.

[In a clinical lecture, this able physician gives the following special rules for auscultation of the circulatory organs.]

1. In listening, says Dr. Bennett, to the sounds produced by the action of the heart and arteries, we should pay attention,—1st, to the impulse; 2d, the character and rhythm of the sounds; 3d, the place where they are heard loudest, and the direction in which they are propagated.

You should commence the examination by feeling for the spot where the apex of the heart beats against the walls of the chest, which will enable you to judge of the impulse. This ascertained, place your stethoscope immediately over it and listen to the sounds. Then place the instrument above, and a little to the inside of, the nipple, near the margin of the sternum, and listen to the sounds there. In the one situation you will hear the first or systolic sound, in the other the second or diastolic sound loudest.

3. If anything different from the normal condition be discovered in either one or the other position, or in both, they should be again carefully examined, and by moving the stethoscope below and round the apex of the heart, or above in the course of the aortic arch or cartoids, on the right and left side, &c., &c., it should be ascertained at what point, or over what space, the abnormal sounds are heard loudest, and whether they be or be not propagated in the course of the large vessels. Occasionally listening over the back in the course of the descending aorta may be useful.

4. When, during the above examination, we discover a new source of impulse and of sound in one of the large vessels, this must be especially examined, the limits of such impulse and sound carefully ascertained,—whether they be or be not synchronous with those originating in the heart,—their direction, &c.

5. Under ordinary circumstances, the respiratory do not interfere with the detection of the cardiac sounds; but where the former are very loud and the latter indistinct, it is useful to direct the individual to hold his breath for a few moments. Sometimes, the impulse and sounds of the heart are heard better by directing the patient to lean forward; they, may also, if necessary, be exaggerated and rendered more distinct by directing him to walk up and down quickly, or make some exertion for a short time.

Of the Sounds elicited by the Circulatory Organs in Health and Disease.—On placing your ear over the cardiac region in a healthy person, you will feel a beating, and hear two sounds, which have been likened to the tic-tac of a watch, but to which they bear no resemblance. They may be imitated, however, very nearly, as pointed out by Dr. Williams, by pronouncing in succession the syllables *lupp, dupp*. The first of these sounds which is dull, deep, and more prolonged than the second, coincides with the shock of the apex of the heart against the thorax, and immediately precedes the radical pulse; it has its maximum intensity over the apex of the heart,—below and somewhat to the outside of the nipple. The second sound, which is sharper, shorter, and more superficial, has its maximum intensity nearly on a level with the third rib, and a little above and to the right of the nipple—near the left edge of the sternum. These sounds, therefore, in addition to the terms first and second, have also been called inferior and superior, long and short, dull and sharp, systolic and diastolic,—all which expressions, so far as giving a name is concerned, are synonymous.

The two sounds are repeated in couples, which, if we commence with the first one, follow each other with their intervening pauses, thus—1st, There is the long dull sound coinciding with the shock of the heart; 2nd, There is a short pause; 3rd, The short sharp sound, and 4th, A longer pause,—all which correspond with one pulsation. In figures, the duration of these sounds and pauses by some have been represented thus,—the first sound occupies a third, the short pause a sixth, the second sound a sixth, and the long pause a third. Others have divided the whole period into four parts; of which the two first are occupied by the first sound, the third by the second sound, and the fourth by the pause. The duration, as well as the loudness, of the sounds, however, are very variable even in health, and are influenced by the force and rapidity of the heart's action, individual peculiarity, and form of the thorax. Their extent also differs greatly. They are generally distinctly heard at the precordial region, and diminish in proportion as we withdraw the ear from it. They are less audible anteriorly on the right side, and still less so posteriorly on the left side. On the right side posteriorly they cannot be heard. Their tone also varies in different persons; but in health they are free from a harsh or blowing character.

Great diversity of opinion has existed regarding the causes of these sounds, —all of which you will of course have heard discussed before coming here.

You must never forget, however, the cardiac actions which coincide with them; for our reasoning from any changes we may detect, will entirely depend upon our knowledge of these. We may consider, then, that there coincide with the first sound,—1st, The impulse, or striking of the apex against the thoracic walls; 2nd, Contraction of the ventricles; 3rd, Rushing of the blood through the arctic orifices; and 4th, Flapping together of the auriculo-ventricular valves. There coincide with the second sound,—1st, Rushing of the blood through the auriculo-ventricular valves; and, 2nd, Flapping together of the aortic valves. Contraction of the auricles immediately precedes that of the ventricles. The result of numerous pathological observations, and of many experiments, is that, in health, the first sound is produced by the combined action of the auriculo-ventricular valves of the ventricles, and of the rushing of the blood, which sound is augmented in intensity by the impulsion of the heart's apex against the thorax; whereas the second sound is caused only by the flapping together of the sigmoid valves.

With the cardiac as with the respiratory sounds, the alterations which take place during the disease may be divided into,—1st, Modifications of the sounds heard in health; 2nd, New or abnormal sounds.

I. *Modifications of the Healthy Sounds.*—These refer to the variations the healthy sounds present in their seat, intensity, extent, character, and rhythm.

Seat.—The sounds may be heard at their maximum intensity *lower* than at the points previously indicated as in cases of dilated hypertrophy of the left ventricle, enlargement of the auricles, or of tumours at the base depressing the organ. They may be *higher* owing to any kind of abdominal swelling pushing up the diaphragm. They may be more on *one side* or the other, in cases where the heart is pushed laterally by effusions of air or fluid in a pleural cavity. Various other circumstances may also modify their natural position such as tumors in the anterior or posterior mediastinum, aneurisms of the large vessels, adhesions of the pericardium, deformity in the bones of the chest, &c., &c.

Intensity and Extent.—These are *diminished* in cases where the heart is atrophied or softened; when there is pericardial effusion, concentric hypertrophy of the left ventricle, or emphysema at the anterior border of the left lung. They are *increased* in cases of dilated hypertrophy, of nervous palpitations, and when neighbouring portions of the lung are indurated, especially in certain cases of pneumonia and phthisis pulmonalis.

Character.—The sounds become *clearer* or *duller* than usual according as the walls of the heart are thinner or thicker. Occasionally they sound *muffled* in cases of hypertrophy or softening of the muscular walls. Not unfrequently there is a certain degree of *roughness*, which is difficult to determine as being healthy or morbid. Occasionally it ushers in more decided changes; at others, continues for years without alteration.

Rhythm or Time.—I need not say that the frequency of the pulsations differs greatly in numerous diseases altogether independent of any special disease in the heart. In certain cardiac affections, however, the beats are *intermittent*, in others *irregular*—that is, they succeed each other at unexpected intervals. The *number* of the sounds also varies. Sometimes only one can be distinguished, it being so prolonged as to mask the other. Occasionally three or even four sounds may be heard, depending either on reduplication in the action of the valves when diseased, or on want of synchronism between the two sides of the heart. Not unfrequently the increased and irregular movements of the organ, combined with the sounds, are of such a character as to receive the name of *tumultuous*.

II. *New or abnormal Sounds.*—These are of two kinds: 1st, Friction murmurs; 2d, Blowing or vibrating murmurs. Dr. Latham has called them *exocardial* and *endocardial*. I am in the habit of denominating them *pericardial* and *valvular*.

Pericardial or Friction Murmurs.—The murmurs are the same in character, and originate from the same causes as the friction noises connected with the pulmonary organs. It is only necessary to observe, that occasionally they are so soft as closely to resemble blowing murmurs, from which they are only to be distinguished by their superficial character and limited extent.

Valvular or Vibrating Murmurs.—These murmurs vary greatly in character,—some being so soft as to resemble the passage of the gentlest wind; others are like the blowing or puff from the nozzle of a bellows (*bellows murmurs*;) whilst others are harsher, resembling the noise produced by *grating*, *filing*, *sawing*, &c. They are all occasioned, however, by diseases interfering with the functions of the valves. Sometimes these do not close, and the blood consequently regurgitates through them; at others, whilst this is the case, they are constricted, indurated, roughened, and even calcareous,—whence the harsher sounds. They may be single or double, and have their origin either in the auriculo-ventricular or arterial valves, or in both at once,—the detection of which constitutes the diagnosis of the special diseases of the organ. Occasionally these sounds resemble *musical notes*, more or less resembling the cooing of a dove, singing or twittering of certain small birds, whistling, tinkling, &c., &c. These depend either upon excessive narrowing of the orifices, or upon any cause which induce vibrations of solids in the current of blood,—as, when there are perforations in the valves, irregularities of their margins, string-like or other shaped exudations on their surface, &c., &c.

Auscultation of the large vessels.—On listening through the stethoscope placed over the arteries in the neighbourhood of the heart, we hear the same sounds as are produced at the sigmoid valves, propagated along its course, but more indistinct as we remove the instrument from the base of the heart. Those which are more distant have only one sound, which is synchronous with their impulse and their dilatation. This sound is of a dull character, but in health always soft.

In the various conditions of disease we have a single or double bellows sound, or it may be harsh, grating, rasping, &c. In the first place, you must ascertain whether any of these sounds are propagated along the artery from the heart, which you will know by listening over its course from that organ, and observing whether they increase as you proceed towards it. If the sound have an independent origin, it may originate from disease of the internal surface of the artery, when it will be harsh in proportion to the roughness; from stricture of, or pressure on the vessel, or from its dilatation. Generally speaking, the more dilated and superficially seated the vessel is, the sharper is the sound. Sometimes there is a double murmur in the course of a vessel, having an undoubted independent origin. This is most common in cases where there is an aneurismal pouch, into which the blood passes in and out through an opening narrower than the swelling itself. Occasionally one or both such murmurs may possess somewhat of a metallic ringing, or even musical character, when the margins of the opening are probably tense and thrown into peculiar vibrations.

I have already told you never to form a conclusion from auscultation alone. Even when combined with percussion, it is not safe to form a diagnosis without a knowledge of *all* the circumstances of the case. Hence, why I repudiate those rules which have been published in books, that have for their object the establishment of opinions from physical signs alone. At the same time, there can be no doubt that percussion and auscultation are absolutely essential to the proper investigation of maladies, although not more so than other modes of inquiry. I have, therefore, thought it best to give you a condensed resumé of the sounds which may be heard by auscultation of the lungs, heart, and large vessels, pointing out a few of the diseased states in which they may be sometimes (not always) heard, and especially indicating the physical conditions on which they are supposed to depend. Their true diagnostic value can only be learned by the careful examination of individual cases.—*Monthly Journal of Med. Science, Nov.*, 1850, *p.* 447.

30.—RHEUMATIC PERICARDITIS.

Reported by Dr. Charles Kidd.

[As cases of pericarditis are now so very frequently met with—being much more narrowly looked for than was the case formerly—and as the views of the nature and treatment of the disease have somewhat changed, the following may not be uninteresting to our readers.]

Few diseases are more obscure in their origin—few more insiduous and dangerous if neglected. The very essential nature of the organ engaged explains this, as well as the very general constitutional disturbance that always accompanies the affection. In rheumatic pericarditis, we have, possibly, two separate conditions of the system to contend against: one, a coagulable condition of the blood, in which the fibrin becomes increased in quantity, and is merely held in solution in the serum; the other, a state of actual arthritis, or acute inflammation of the joints, seldom or never going on to effusion or suppuration. An old opinion, coming again to the light, would ascribe the disease to a *materies morbi* in the blood, of which we know little, but that, as this fibrin increases in the blood in rheumatism, the blood-corpuscles decrease, the fatty matters of the blood also increasing; that a development of lactic acid takes place at the same time in Prout's secondary assimilative process, always evinced in the deposits of the urine, in the perspiration, &c.

Whether all these changes are sufficient to account for the great constitutional disturbance of rheumatism, or are merely links of a chain, beginning in a profound disturbance of the organic nervous system, and conveyed to the vascular system, and of course to the blood, may, perhaps, be still open to speculation. That a powerful impression by chills or cold on the nervous system, however, is the starting point of the disease in many cases, there can be no doubt. The disease is very common among the poor from this cause,—damp and cold, externally, preventing the generation of animal heat so connected with the proper functional activity of the organic system of nerves, influenced also and aggravated by atmospheric influences. The several complications we meet with depend, possibly, on pre-existing lesion, or disorders of the particular organs engaged; that of pericarditis, on some specific connexion between rheumatic inflammation of fibrous tissues, and the membrane surrounding the heart, which we cannot yet exactly explain.

The number of cases of pericarditis, in connexion with rheumatism, to be met in large hospitals like Guy's and St. Thomas's must be familiar to the reader. Of course, the case following in this report, (selected out of many others), under the assiduous care of Dr. Barlow, cannot pretend to much novelty; yet as exhibiting the more improved treatment at present used, and the general manageableness of such cases, it cannot fail to be of interest.

The treatment of pericarditis has recently undergone considerable modification. Taking blood by venesection, which would first suggest itself, though necessary in some cases, in others is all but inadmissible. It has been recently shown by Bouchardat, that rheumatism may even be induced by the coagulable state of the blood, the result of repeated bleedings. Every particular case, of course, will require a different line of action. Venesection after the middle of the first week, as a general rule, will lengthen the period of recovery, and many cases will not require bleeding at all.

The local abstraction of blood in rheumatic pericarditis will be always found the most beneficial. The treatment must vary, as we have to treat patients ill-fed and etiolated in cities, or healthy and full of red blood in the country. Antimony, alkalies, nitre, and colchicum, are very valuable. The exhibition of mercury has been lately dwelt upon, the general impression being that its beneficial effect will, in a great measure, depend on the period at which it is given. If early in the disease it will prove much more satisfactory than later, its action being more properly directed to prevent the deposition of organisable matter in the pericardium than to remove it afterwards. Indeed, our late statistics would go to prove that salivation has no very marked effect on the disease at all, the ceasing of the friction sound, according to Taylor, being more of a coincidence than really brought about through the agency of the mineral. As to the use of tartar emetic to remove inflammation, perhaps there is no difference of opinion; the dangerous effects of this valuable medicine having little or no existence except in the estimate of those who have not studied its effects.

[*Case.*—Margaret B., aged 20, single, had suffered formerly from rheumatism, and lately very much from debility, and irregular menstruation. She complained, on admission into Guy's hospital, of burning hot pains in the joints, and all the accompanying symptoms of rheumatic fever. The heart's action was found to be quite normal, as well as the impulse, a very feeble bruit being perceptible with the first sound, particularly over the valves. The second sound free. Ordered pills with antim. tart. and calomel, and a draught for the morning, with senna and vin. colchici, to be kept very quiet, and to get simple drinks, without food. As the symptoms of pericarditis gradually came on, with acute pain below the left nipple, between the fifth and sixth ribs, a rubbing sound was detected with the systole, and occasionally of a "to and fro" character. Cupping glasses were now put on, and ℥vj. of blood drawn from the cardiac region, the former medicines being continued. Although the "rubbing sound" continued for six days longer, the general symptoms began to improve; but the bruit began to be traceable along the aorta. She was now, in addition to the same medicines, ordered a blister to the region of the heart. In a week after this, the pericarditic symptoms had entirely disappeared, although she had suffered some little relapse.]

It is not speculating, perhaps, too widely of our present purpose to say, if this young woman had been treated by any of the heroic plans of treatment formerly in vogue, she would be still a patient in a debilitated state in hospital. The practical fact for our consideration is, that bleeding lengthens out the period of recovery, and if not used early, so as to counteract the inflammation at its commencement, its use afterwards becomes more and more doubtful. The experience of different practitioners will, of course, differ with respect to this remedy and mercury, but a good deal may be explained by the character of the different patients under observation,—whether stout and well fed in the country, or, as is unhappily too often the case, ill fed and badly nourished in cities,—the safer rule, at least in cities, is not to debilitate further if it can possibly be avoided.

Pericarditis, under any mode of treatment, I need scarcely remark, is a very dangerous disease; the mere effusion may, by its pressure, so embarrass the heart as to bring on fatal consequences. Again, it may produce the most opposite results as regards this organ; atrophy from pressure; hypertrophy and cartilaginous hardening of the walls of this viscus, and even fatal softening. When pericarditis does not end in resolution, the next best thing is possibly, adhesion of the opposite surfaces of the pericardium: this, also, is a very serious change in the organ. The constant association of endocarditis with inflammation of the pericardium explains, also, many of those organic diseases so fatal and so trying to the ingenuity of the practitioner. For all these reasons, indeed, pericarditis is a disease that cannot be too deeply studied, and that should not be allowed to go on one day longer than can possibly be helped. In renal diseases, and in rheumatism, we should always look out for it. Pericarditis is much commoner in children than generally suspected; no doubt laying the groundwork of those multitudinous cases of organic disease of the heart met with in after life. One of our pervading errors, perhaps, has been to look on rheumatism as a mere local disease, and pericarditis a metastasis. Nothing can be more erroneous. Rheumatism is a strictly constitutional disease, and this very serious disease of the pericardium an intregal portion of it, perhaps from the beginning.—*Med. Times*, *Aug.* 10, 1850, *p.* 143.

31.—CASE OF PURPURA, WITH REMARKS ON THE STYPTIC PROPERTIES OF OIL OF TURPENTINE.

By Dr. William Budd, Physician to the Bristol Infirmary.

[M. A. Riley, widow, aged 65, of spare habit and broken health, and very infirm. For the last twenty-one months she has suffered much from want, being often without sufficient food for days together, besides which, asthma and cough, attended with profuse expectoration, have added much to her weakness.]

Five days before admission she discovered, on getting out of bed, that her body and limbs had become thickly sprinkled with dark purple spots; she also observed that her urine was bloody, and in the course of the same day she began to bleed profusely from the mouth. Her stools were like soot. She had, in fact, become the subject of *purpura hemorrhagica.* It would appear from her account, that these phenomena came on quite suddenly—a fact not new to the history of the disease, but probably of some importance as to its pathology.

On the following day she grew rapidly worse. Blood flowed from the mouth without ceasing, and much was also voided in the stools and urine. On the 17th of May she reached the hospital very faint and exhausted, having come on foot from her own house, about two gun-shots off. Within an hour after her admission I was summoned to her, as she appeared to be fast sinking. I found her in a state of alarming collapse. Her body and limbs were thickly covered with the characteristic ecchymoses, whose peculiar purple colour first gave the name to the disease. These ecchymoses were especially numerous and thickly set along the shins of both legs and the corresponding aspect of both forearms; on the thighs and upper arms they were more widely scattered, and on the trunk more widely still. In their general arrangement they were strictly symmetrical. As further illustrative of this, it may be mentioned, that there was an ecchymosis in the outer corner of each eye, and one at each angle of the mouth. The centre of those at the corners of the mouth was occupied by a small slough in process of separation. In the interior of the mouth, at a spot corresponding to the centre of the right cheek, there was a similar slough, nearly an inch long, and about half an inch broad. Blood was oozing very freely from under the detached border of all these sloughs. On the outside of the cheek was a large bruise mark, corresponding to the seat of the slough within. Numerous large blotches or bruise marks of the same kind were plentifully scattered over the surface generally. In addition to these, the following particulars were noted in the course of the day: gums firm and of natural colour; stools sooty and like coffee-grounds; urine the colour of blood, highly albuminous, and throwing down on being allowed to stand, a layer of grumous blood, occupying about one-sixth of the whole depth of the fluid.

Face pallid, without yellowness, and, with the exception of the large blotch already mentioned, free from ecchymoses. Tongue and interior of mouth much blanched. Debility extreme; faintness on every change of posture; tongue tremulous; pulse 100, small and weak; no febrile movement; appetite tolerably good; thirst natural; no enlargement of liver or spleen; extremities cold. Cough frequent; expectoration copious; sputa opaque, greenish, diffluent; physical signs of a high degree of emphysema, with catarrhal râles.

I ordered her to be put on a generous and varied diet, including meat and vegetables, milk, and eight ounces of wine. In the shape of medicine, she was to take two scruples of chlorate of potash daily, and ten grains of extract of krameria, in a wine-glassful of the decoction of logwood, every four hours. My colleague, Mr. Morgan, directed the bleeding sloughs to be "mopped" frequently with a dossil of lint soaked in oil of turpentine.

The effect of this measure was immediate. The bleeding ceased from the moment of the first application of the turpentine, and did not afterwards return; the sloughs soon came away, and in a few days, under the continuance of the same treatment, the sores were healed.

On the other hand, there was not the slightest check put to the other symptoms. The urine continued to be as much charged with blood as ever; the evacuations as black and sooty; and fresh ecchymoses made their appearance in great number from day to day. Wherever any, even the slightest, pressure was made, a large bruise mark was sure to be seen shortly after. The bodily weakness increased rapidly, and it soon became plain that, unless means could be taken to stay the loss of blood, the poor woman could not survive many days longer.

Matters being at this pass, on the 21st, after four days trial, the chlorate of potash and astringents were given up as of no avail, and in lieu thereof twenty minims of oil of turpentine, in emulsion, were ordered to be taken every six hours. An immediate amendment followed the change of the plan. Before four doses of turpentine had been given all hemorrhage had ceased. On the following day the urine was pale and transparent, free from albumen, and every other trace of blood; blood ceased to appear in the evacuations from the bowels, and no new ecchymosis occurred on the surface of the body.

On the 28th, seven days after beginning the use of turpentine, the blood extravasated into the conjunctivæ had nearly disappeared, and the spots over the body generally had much faded.

Meanwhile, the patient had gained greatly both in flesh and strength. Her recovery suffered no interruption, and on the 21st of June she left the hospital much improved in health and condition. The turpentine was continued for a fortnight only. On the 4th of June, there being no trace of purpura remaining, it was given up, as of no further need. On the 25th of May, the evening dose was vomited. One drop of creosote was, in consequence, added to each dose of the emulsion, and no sickness occurred afterwards. On the 28th there was some strangury, but this ceased at once on a slight reduction of the quantity of turpentine taken.

I shall not detain the reader from what he must already see to be the chief point of interest in the case just related, by any lengthened comments on the subject of purpura generally. Materials for the true pathology of this disease are as yet wanting, and it is not pretended that this case furnishes any addition to them. On this matter I will content myself, therefore, with a single remark. Purpura is no doubt correctly described as being in the main, a disease of the blood. But, although the blood may be principally in fault, I think it is going too far to assume, as many do, that the altered state of this fluid is the *direct* and sole cause of its remarkable tendency to escape from the vessels. That it is in part the cause of this tendency, there is no reason to doubt; but that it is wholly so, is not proved. Although nothing of the kind has as yet been shown by direct observation, it seems to me more than probable that weakness of the vessels themselves, from defective nutrition of their walls, has a still larger share in the result. The symmetrical distribution of the ecchymoses is a fact which is, on the whole, strongly in favor of this view. Did time permit, I could mention others, which seem scarcely to admit of any other conclusion.

Equally foreign to our present purpose would it be to enter at length into the question as to whether there be any relationship—pathological or other—between purpura and scurvy. To show that these two diseases are essentially distinct requires no laboured proof. It is enough to appeal to the striking contrast between them touching the circumstances under which they are known to arise. It has long been finally established that the one and sole cause of genuine scurvy is prolonged absence from fresh vegetables. Persons even moderately supplied with fresh vegetables, or their expressed juices, never get scurvy. Persons ever so abundantly supplied with them may get purpura in its worst forms. The three most rapidly fatal cases of purpura I have ever seen, occurred in persons who for months before had lived chiefly on potatoes and greens.

In scurvy, fresh vegetables and their juices are a speedy and infallible cure; in the treatment of purpura there is no proof that they have any efficacy beyond that which they possess as necessary constituents of a complete and wholesome diet.

These differences are fundamental, and it is clear that the two diseases to which they belong must be distinct in their very essence. Both may be characterised, more or less accurately, as diseases of the blood; and, in both, there is a peculiar tendency in this fluid, to escape from its vessels; but here all similarity ends.

These considerations are, however, wide of our present mark. The interest of the case of M. A. Riley, is, I need scarcely say, wholly practical, and lies in its value as a striking illustration of the styptic properties of the oil of turpentine. It would, of course, be highly unphilosophical to found any conclusions as to the efficacy of a remedy from the observation of its effects in a single case. The result which here followed so closely upon the administration of turpentine has, however, been observed before in other cases without number. In purpura, especially, its virtues have long been known. The late Dr. Whitlock Nicholl believed it to be quite a specific for this disease in its idiopathic form, and to judge from the case before us, he was not so far wrong. I may add that since this case occurred, I have met with three others in which hemorrhage of various kinds and from various sources ceased at once, on the administration of turpentine, after other medicines had failed. The first of these was also a case of purpura; the second, a case of hemorrhage from the nose and kidneys; the third, one of hæmoptysis, from tuberculous disease of the lung. In the last, the outpouring of blood was truly appalling. The patient had already coughed up more than two quarts (by measure) before the first dose of turpentine was given; and yet. in spite of this tremendous loss, the bleeding was still going on without check or abatement.

It is right to add, that the power of this agent to staunch blood is no new discovery. The merit of it belongs, it would appear, to a provincial surgeon,—a Mr. James Yonge, an eminent practitioner, who lived at Plymouth in the time of Charles the Second. Mr. Yonge first made his observations public in the year 1679, in a pamphlet, bearing the quaint title of 'Currus Triumphalis e Terebintho,' or an 'Account of the many admirable Virtues of the Oil of Turpentine.'

[Besides the testimony of many other observers, the illustrious John Hunter, speaking of styptics generally, says,]

"A dossil of lint, dipped in oil of turpentine, after having first wiped the wound clean, in order that it may reach the vessel, is the best, and may be renewed pretty often. I have seen it immediately stop vomiting of blood from the stomach, after all other means had failed, given internally with white of egg, as often as the stomach would bear it. In external hemorrhages, where it had not the desired effect applied externally, I would give it internally. *It is the best if not the only true styptic.* Thus in a case of nasal hemorrhage, which nothing would stop, I gave ten drops of oil of turpentine in a draught, and repeated it every two or three hours, which entirely stopped the bleeding in less than twenty-four hours, and it never returned."

The testimony of Mr. Vincent, late senior surgeon to St. Bartholomew's is to the same effect, and equally strong. After making some observations on the subject of the hemorrhage diathesis, this experienced surgeon goes on to say—

"A most desirable object would be obtained by securing some remedy that would alter this peculiar disposition in vessels to bleed, and arrest the loss of blood; so that it may not continue to endanger the life of the patient. I have so invariably found turpentine infallible in effecting this intention, that it may, I think, be depended upon as a most valuable remedy.

"Some years ago a youth was brought to me who was passing blood in his urine. I ordered some draughts, with a few drops of oil of turpentine; the bleeding quite stopped before the end of the second day, and did not return. About a twelvemonth afterwards he was brought to me, having cut his finger but slightly; it had continued bleeding for some days. I gave him turpentine again; it stopped in a day or two.

Not long after he came a third time to me; he had a tooth extracted. and it had been bleeding for several days. The turpentine was had recourse to, and the remedy soon acted in the same sanitary way. I have several times been called in on account of hemorrhages where teeth have been extracted, and have never seen the turpentine fail in this nor in other similar cases of hemorrhages."

The reader will not fail to remark. that the evidence which has now been laid before him, not only tends to show that oil of turpentine is possessed of styptic powers of a high order, but that, if this evidence be good. these powers are effectual in issues of the blood from sources the most various, and arising from causes the most diverse. Tuberculous hemoptysis. nose-bleeding, hematemesis, purpura, and traumatic hemorrhage, have little else in common, beyond the fact of an unnatural escape of blood from its vessels. The effects of turpentine in purpura, therefore, are most probably directed, not against purpura as purpura, but against purpura as hemorrhage. Bearing this in mind, I beg it to be also borne in mind, that in the case of M. A. Riley, not only did the bleeding from the kidney cease immediately after its administration, but that from the intestine also, as well as the tendency to extravasation from the vessels of the skin.

Another very important fact, that would also seem to be established by this evidence, is, that turpentine is even more effectual in arresting hemorrhage, when directly applied to the bleeding surface than when it is given internally. From these facts taken together, the inference would seem to be pretty secure, that its virtues as a styptic must depend on its exerting some direct influence on the contractile power of the blood-vessels. In the elementary nature of such a property we seem to find the best, and indeed the only, plausible explanation of the equal efficacy of this medicine in restraining bleeding under such a great variety of pathological conditions. In the adoption of this view, we also obtain, if I mistake not, the best guide to the cases in which its administration is most likely to be successful. They are, on the one hand, the great group of hemorrhages, which are generally characterized by pathologists by the epithet *passive;* and, on the other, those in which, in addition to its general action, the remedy comes into direct contact with the surface from which the blood is issuing. I have had no experience of its effects in hematemesis arising from simple ulcer of the *stomach*, but from what we witnessed in the case of our patient's *mouth*, I can readily believe that Dr. Seymour is right in the conclusion to which he has come, that in that disease it not only tends to stop the bleeding, but also promotes the healing of the sore.

In what are called active hemorrhages, it would not seem to be so suitable a medicine. We must not, however, be hampered by definitions like these in cases where life is threatened. Cases of hemorrhage are cases in which, beyond all others, the nice distinctions of pathology have to give way before the great emergencies of practice.

In the treatment of uterine hemorrhage, whether occurring in connexion with parturition or not, the employment of turpentine, both topical and internal, admits, I have no doubt, of much more extensive application than it receives at present. Of its great use in severe menorrhagia from common causes I can speak from my own experience; and in the 'Provincial Medical and Surgical Journal' for the present week, Mr. Griffiths, of Wrexham, gives a series of cases, from which it would appear that, in the dose of half an ounce or an ounce, repeated once or twice, according to circumstances, this medicine often succeeds in arresting at once the flooding which is apt to occur after delivery, and which is sometimes so appalling.

In common cases, such as those of purpura, for instance, where time does not press, I have found doses varying from ten minims to half a drachm quite effectual; but in cases of rapid loss of blood, where, as sometimes happens, every minute is of importance to life, it is better to give half an ounce or an ounce at once, to be followed up by smaller doses at shorter intervals.

I should mislead you, were I not to add, before concluding, that the use of this medicine is not without its drawbacks. Few great gifts come to us without alloy, and turpentine is no exception to the rule. In the first place, there are few drugs more repugnant to delicate stomachs. In many, it excites vomiting; in others, it causes painful strangury; and the irritation of the urinary organs is sometimes so great, that blood is passed with the urine.

Some of these evils may, however, be avoided, or much diminished, by adopting a particular mode of administering the medicine. Thus, I have found that the addition of half a drop or a drop of creosote to each dose almost entirely covers its nauseous taste, and prevents the risk of sickness. Creosote itself is not, it must be owned, the most palatable of drugs, but neither is it nauseating. Ten or twenty drops of spirit of rosemary will help to make the prescription less disagreeable; and of the different vehicles proposed for keeping the turpentine in suspension, I think you will find common mucilage the best.—*Medical Times, August* 17, 1850, *p.* 167.

32.—CONCLUSIONS RESPECTING THE SEAT AND NATURE OF ANGINA PECTORIS.

By Dr. Kneeland, U. S.

Dr. Kneeland draws the following conclusions from his researches into the nature and causes of angina pectoris:

1. From the symptoms and morbid appearances, angina pectoris is not a disease of the lungs, heart and its vessels, or stomach, but an affection of the nerves supplying these organs.
2. Anatomy, physiology, and pathology would lead us to place the seat of angina pectoris in the par vagum, and not in the sympathetic system of nerves.
3. Like other nerves, the par vagum may be affected with neuralgia and rheumatism with inflammation; it may be compressed by morbid growths; its spinal origin may be compromised by hemorrhage, accidental wounds, and various irritations—all of which may cause the symptoms of angina pectoris.
4. Angina pectoris and asthma are intimately related; the *former* being an affection more especially of the *sensitive* filaments of the par vagum; and the *latter* an affection of its *motor* filaments. Both are generally more or less combined in the same case.
5. Angina pectoris is a disease not necessarily fatal, especially in young persons, if accurately diagnosticated, and properly treated.
6. In addition to the remedies of the books, special attention should be given to the inhalation of oxygen, and to the use of electricity.
7. In cases of angina pectoris, attention should be directed to the examination of the par vagum, from its origin to its terminations, which, doubtless, on careful examination, will exhibit lesions sufficient to account for a fatal result. —*Amer. Journal of Med. Sciences, Jan.* 1850, *p.* 271; *Med. Gazette, Aug.* 16, 1850, *p.* 271.

DISEASES OF THE ORGANS OF RESPIRATION.

33.—TUBERCLE.

By John Simon, Esq., F. R. S., &c.

[Mr. Simon describes tubercle as an organizable deposit occurring in various organs under a peculiar constitutional state, termed the scrofulous diathesis. He says:]

Under the influence of a constitutional bias, which is peculiarly susceptible of hereditary transmission, and peculiarly difficult of artificial generation, there occur local deposits of an organic material, which is insusceptible of ulterior development.

[Mr. Simon considers that the debility which frequently accompanies manifestations of the scrofulous diathesis is not essential, but accidental, merely from the fact that the scrofulous patient is generally under the influence of debilitating causes; but that the exposure to these causes, if no hereditary tendency exists, will not produce tubercle, until at least several generations have been thus affected; and Mr. S. cautions us as to the too implicit belief in "the experimental production of tubercle." He says with regard to the production of tubercle in the livers of rabbits, by confinement in a damp dark cellar, with watery vegetable food, that what he has been shewn confidently as tubercular deposit, he has found, by employing a high power of the microscope, that the mass consisted of the minute oblong eggs of some entozoon. Not only has this been the result in a few, but in dozens of cases, and the same ova have been observed in the gall bladder, and in the whole length of the intestinal canal, lining some of the follicles like an epithelium. So far as his experiments have proved, he has never seen tubercle in the rabbit. Mr. Simon then proceeds to the consideration of hereditary transmission. He says:]

Here, however, let me detain you on the subject of the *hereditary transmission* of scrofula, and explain to you what I mean, when I speak of its being continued in this manner from generation to generation. I do not mean that, in the process of procreation, actual tubercular matter passes from the system of the scrofulous father into the germ of the infant, to remain latent there, till circumstances call for its development; nor, that during uterine life, the blood of the child is poisoned by its mother's blood, as occurs in small-pox or syphilis. What I mean is this: that the scrofulous diathesis—that the *disposition to form tubercles* is transmitted; that the child inherits an imperfect pattern of development.

I must explain this more fully, for the inheritance of *dispositions to disease* does not belong to scrofula only; it forms a very important problem in the pathogeny of cancer with its allied disorders (for they are often hereditary) of gout and rheumatism (for they, too, are heirlooms in families); and it accordingly constitutes one of the most considerable questions in the study of General Pathology.

Every one recognises in the process of generation a certain amount of hereditariness—a certain amount of that influence by which a parent becomes *the* pattern of formation for his child. One allows for accidental deviations—for hare-lips, for club-feet, even for an occasional acephalism; but, these allowances being made, one prognosticates with great certainty as to the result of any particular sexual intercourse. No man expects to become the father of an armadillo, of a flying-fish, or a stag-beetle; nor (except in the Arabian Nights) do royal husbands believe that their princesses can be accouched of logs of wood. But more than this, it is expected, and, on the whole, very generally realized, that the child shall be more like its father than its god-father. So far the case is clear; but I wish you to observe the tendency further. Follow the child in its ulterior development (for that is the point) and mark how exactly, in various exterior and noticeable signs, he repeats the development of *his* father; how, in arriving at the age when his father got corpulent, he acquires the same figure; how, at the age when his father became grey, or bald, he, too, becomes grey or bald, and with the same succession of parts—vertex first, or temples first, or forehead first, as the case may be: how his teeth decay, or drop, or protrude, just as his father's; how his pulse is of the same general character—even, as I have often noticed, to the degree of copying an intermittent rhythm (not accounted for by organic heart-disease); and how his habits of sleeping and waking follow the same direction.

Now, observe, (for the distinction is of great importance) that these things are not *connate*; the child is not born a copy of his father as he begat him; but he is born, having his father's past development as a type for his own future development, so that he shall be developed as his father was developed, and shall hereafter become like him. In addition to that *general law* of human development, by virtue of which he is destined to be a mammal rather than a bird; and a man rather than an ox; and to reach puberty, manhood, old age, and death in a certain defined succession; he is further possessed by an inherited *personal and particular law* of development, which affixes a something peculiar and individual to his passage through each period of his existence.

If my meaning in all this has been intelligible to you, you will readily conceive that diseases *affecting the development of the body* are peculiarly those which would transmit themselves in the line of hereditary succession; that the disposition to a disease would be hereditary, where the disease consisted in the results of a vicious type of development, affecting limb or viscus, solid or fluid in the body; and that no disease would be hereditary except in so far as it might be developmental.

Practically this is notorious. There used to be a comical print in the shop-windows, with the inscription "a chip of the old block;" it represented an old seaman having his infant son presented to him; and this new-born individual was made to carry the family likeness by having a wooden leg exactly like his father's. Every one could smile at this absurdity, because of the general recognition of what I have just stated to you. Accidental mutilations do not become hereditary: for many centuries the Jews and the Mohammedans have undergone circumcision of the prepuce; but the local deformity has never transmitted itself; the new-born Jew or Mussulman offers probably as much foreskin to the shears, as the immediate successors of Abraham or Mohammed.

If, on the contrary, one could so regulate the embryonic development of a human being, that it should be born having one leg, or no prepuce; and still more, if one could repeat this modification of development for two or three generations; then, I entertain no doubt that the peculiarity acquired in these generations would transmit itself indefinitely in the future productions of the race.

And, if you transfer these arguments to the several varieties of disease, you will know, on the one hand, in what diseases to anticipate hereditary transmission; and, on the other hand, what peculiar character of disease (to wit, its developmental character) may be inferred from the fact of its hereditary succession. Of a disease like scorbutus, or ague, dependent on the presence or absence of certain exterior accidental conditions, you would anticipate that it could not be hereditary, any more than a wound or dislocation. Of those accidental accompaniments of scrofula—the morbid processes which arise in defective nutrition (the ulcerations of the cornea or intestines for instance, which depend on insufficient or inappropriate nourishment) and which, as I have said, are essentially co-extensive in their duration with the exterior causes which produce them—you would know that they could have no natural tendency to perpetuate themselves in this way. Of another disease, on the contrary—one like plethora, relating essentially to the rate or degree of development in an element of the body, you might predict that it would tend to become hereditary. And whereas it is in the blood, more strikingly and more constantly than in any ingredient of the organism, that development is ever in progress; whereas, it is eminently in the blood, that we have at each moment an epitome of the whole development of the body, and find the earliest rudiments and the latest reliques of every organised tissue, nascent or in decay; so surely it would be in this fluid—the scene or the subject of so many developmental metamorphoses, that one would expect to find the material explanation of many hereditary diseases. One would expect that an inherited disposition to form, at various periods of life, and in a number of different organs, certain special and characteristic materials, bearing definite relation to the normal products of the body, would indicate a peculiarity in the development of the blood, whereof those deposited materials would be the result and the expression.

Such is the state of the case in regard of scrofula; and therefore it is, that I have analysed this question of hereditary tendencies to disease. Strict experiment would not, I think, justify me in telling you *as a certainty*, that the scrofulous diathesis has its explanation in such ground as we have gone over; but, though we are short of absolute demonstration on the subject, I may tell you this with confidence: there exist many facts rendering it highly probable that tubercle has its rise in disease of the blood; that this disease of the blood is one affecting its development; and that it is as a *developmental disease of the blood* that scrofula acquires its tendency to hereditary succession—its tendency to perpetuation as part of a family likeness. I shall presently give you other evidence in support of the same view.

Meanwhile, to return for a moment to the narrower ground from which we started, remember, that what is meant in calling scrofula an hereditary disease, is—not that the tubercular material is to pass from parent to child—not that the child is to be born with tubercle already in its body, but that the disposition to *form blood in a manner which shall give tubercle as a collateral phenomenon*, exists as a clause in the child's charter of life, and forms a part of its type of development, as truly as any exterior resemblance which he may bear to the configurative growth of his parents.

[Amongst the female phthisical patients at the Consumptive Hospital last year, 36 per cent. reported their parents as having been consumptive. The importance of this statement will be apparent, especially when we remember that in the remaining 64 per cent. there may have been a considerable proportion whose parents had not, indeed, suffered from tubercular phthisis, but may have suffered from tubercular deposit predominantly in other organs than the lung; and that there may have been a second considerable proportion whose parents may have escaped tubercular disease in their own persons, but may yet have transmitted the predisposition from their own immediate predecessors to those later inheritors of the disease.]

With respect to the material of tubercle, you so often have opportunities of seeing it, that I need hardly detain you with any elaborate description of its characters. "When in that condition that its properties are most clearly marked, and when at that period of its development that no dissentient opinions are held as to its nature, it presents (says Dr. Walshe) the following characters:—It is an opaque substance, of yellowish colour; sufficiently firm, yet friable; of little tenacity, and resembling cheese very nearly in point of consistence; inelastic; without particular smell; accumulated in small masses, varying in size from a pin's head to a hen's egg; of homogeneous aspect all over their divided surface; exhibiting no vessels; insoluble in water, and, if mixed therewith, quickly subsiding to the bottom. And these are the properties of a material which, in respect of its physiology, is characterized by its tendency to become soft, after it has existed for a variable period in the condition of firmness, and to induce various changes in the natural textures with which it is connected—changes eventually affecting its own complete disintegration and elimination. In the same natural texture with such tuberculous matter as we have now described are very frequently found certain small bodies, varying in size from that of a pin's head to a very small pea, of greyish-white or greyish tint, and glistening aspect.

These bodies occur in different organs and textures, in association with yellow tubercle; they are more or less transparent; and though in their own substance of light-greyish colour, their translucency sometimes gives them, in appearance, the tint of the circumjacent structure; their section exhibits a smooth and close surface; hard as cartilage, almost, in some instances, and invariably remarkable for firmness; in general outline seeming roundish, yet in reality of somewhat angular form, and adhering so closely to the adjoining tissues, that they cannot be removed without particles of these; they have a striking tendency to accumulate in groups."

Such, then, are the two conditions in which the scrofulous product may show itself,—either as the *yellow tubercle*, or as the *semi-transparent grey granulation;* and as regards the relations of these to each other, it appears that (in organs where both occur) the grey granulation is the earlier deposit; that it may be seen alone; that the yellow material may be seen in its substance, and may gradually take its place; that, in short, it may fairly be considered to constitute a first stage of the local disease, and to be preparatory for the more characteristic yellow deposit. This, however, must not be understood, by any means, as of universal application; for there are many organs, (as, for instance, the lymph-glands and brain) in which the grey granulation has rarely or never been seen, although the yellow tubercle is among their frequent diseases; so that the former deposit cannot be considered necessary for the development of the latter. It is especially in the lungs, that the grey granulation is habitually encountered; and in these organs unquestionably it seems to form a point of attraction—a matrix or a nucleus—for the yellow deposit.

The material of tubercle habitually presents itself in the shape from which its name is derived—namely, as *tubera* or rounded bodies, varying from the size of the smallest pin's head to that of an orange; evidently attaining their larger development by means of exterior accretion; and tending, where numbers exist together, to coalesce into irregular (though still tuberiform) masses. Where the individual tubercles have reached the size of the smallest pea, their substance consists almost invariably of the yellow material. In some organs, the structure which intervenes between separate tubercular masses, will show to the naked eye no other than its normal characters; but in the lung it is frequent to find considerable inflammatory condensation of this intervening tissue. Sometimes, too, in this organ, a large irregular extent of structure will have lost its natural sponginess, will have become dense and impervious to air, though still moist and compressible, and will present, on section, a nearly homogeneous, glistening, semi-transparent section, at various points of which one may perceive the deposit of yellow tubercular material. It is this latter condition—one by no means frequent in its occurrence—which is known by the name of tubercular infiltration; it apparently consists in the accidental presence of true tubercle in the midst of common chronic hepatization of the lung from pneumonia, and may be supposed to depend on a partial tubercular change of some prior inflammatory exudation.

Tubercular deposit in the lymphatic glands is in so far an exception to the general description I have given, as not to present itself at first in the spherical or tuberose form. Sections of a scrofulous lymph-gland, made when its mass is only partially tubercular, show an irregular yellow blotting of the cut surface, not arranged in circles or segments of circles.

Masses of yellow material, like firm curd-cheese—existing either in a concreteness which allows it to be squeezed from the diseased organ, as though from a follicle, or else diffused in the substance of such an organ, and blended with its structure, so as not to be isolable by pressure or dissection; and smaller masses of semi-transparent grey material, extremely firm, and presenting a close resemblance to certain forms of fibrinous concretion observed on the valves of the heart: these, then, are the two sorts of deposit habitually noticed in the tissues of scrofulous persons; and it will be obvious to you that the first-mentioned is the characteristic and distinctive product.

Microscopical examination of tubercle shows the following principal ingredients: (1) a substance which constitute distinctively the bulk of the grey granulations, and which in its general character is identical with the matter of condensed fibrinous concretion; namely, a dense, transparent, and almost homogeneous stroma, soluble in acetic acid and in the alkalies: (2) granular material, often in overwhelming abundance, especially in the yellow tubercle (where it is superadded to the former constituent) and consisting partly of fibriniform granules, partly of molecular oil: (3) aborted cyto-blasts, dark, condensed, mis-shapen, angular, insoluble in acetic acid.

These, it appears to me, are the characteristic elements of tubercle; and, in addition to them, we habitually observe the admixture of other and accidental products—viz., (4) calcareous granules, frequent in some forms of tubercle, representing the material by which they are liable to cretaceous transformation, and consisting mainly of the phosphate and carbonate of lime; (5) shapes evincing the various stages of pus-development, and derived from inflammatory changes in the adjoining non-tuberculized parenchyma of the organ—changes due to the proximity of the tubercular concretion, and manifested chiefly at the period of its softening; (6) especially in the lung, a variety of cell-forms native to the organ; epithelium of larger and smaller bronchial tubes, ciliated, and non-ciliated, often presenting partial abnormalities of growth due to chronic irritation of the mucous membrane; (7) blackening carbonaceous deposit, which is especially common about such grey granulations as are becoming obsolete; (8) plates of cholesterine and glomeruli of oil, mixed in the detritus of softened tubercle; (9) remnants of the original tissues through which the tubercular deposit has been infiltrated; as, for instance, in the lung, fragments of elastic fibre.

No formation of new blood-vessels ever occurs in connexion with the processes of tubercular deposition. On the contrary, each mass as it forms, effects a complete obliteration of all the capillaries within its sphere of infiltration, so as to become utterly non-vascular. In the concrescence of several tubercular masses, intermediate arteries and veins may remain previous, and continue to maintain the circulation of blood in parts more distant; but the tubercle itself, however large, has no trace of capillary circulation in its interior; it is essentially bloodless.

You will observe, in this enumeration of the elements of tubercle, that I make mention of no characteristic cells. I know of none such. I believe, that so far as a given mass is tubercle, so far it is incapable of originating or maintaining any process of cell-growth; and I suspect that some observers have fallen into the error of describing, as characteristic of tubercle, cells which have been derived from the inflammation of adjoining textures. With exception of those large glomeruli or granuliferous cells, which are found in the fluid of softened tubercle just as in deliquescent venous coagula) appurtenant to the disintegrating process, but neither characteristic of tubercle nor habitual to it at other periods of its existence—with exception of these (which are probably of extrinsic origin) and of the undoubted products of inflammation furnished by the vicinity, I am ignorant of any cell-growth associated with tubercle.

The aborted and stationary cyto-blasts which I have mentioned, are very general in tubercle, and probably represent modified natural elements of the lymph and blood. I should hesitate to speak of them as invariably and diagnostically present, but I do not know that I have ever failed to see them. They are not particularly abundant in the grey granulation.

The ulterior changes of tubercular matter, when once it has been deposited in mass, are almost invariably in the direction of deliquescence. Exceptionally, the grey granulation may become horny, hard as a shot, and incapable of further intrinsic change; or the yellow mass may lose its animal ingredients, and become the seat of a permanent calcification; but, speaking generally, tubercle tends to soften by some chemical converson of its material, and thus, in a liquified form, to be discharged from the system by the ulceration of surrounding parts. It is this process, long confounded with suppuration, with which you are familiar in the process of phthisis, as leading to the formation of vomicæ, and as continuing, in an infinite majority of cases, to form cavity after cavity in the lung, till the patient sinks, exhausted by their discharge and irritation. It is the same process again, which leads to the formation of scrofulous abscesses in the lymph-glands of the neck or mesentery, and in other organs of the body; where we have opportunities of observing the curative processes (identical with the healing of ordinary abscesses) which ensue in parts not of vital importance, when the tubercular material has been enabled to discharge itself.

In the progress of softening, the stroma of the tubercle vanishes; the molecular oil and other molecular matters increase; the involved elements of natural tissue break up, and add the products of their disintegration; serum and pus are contributed by the surrounding structures; glomeruli arise; and the whole mass, becoming saturated with fluid, shows, on microscopical examination, a mixture of organic detritus with incidental inflammatory products.

When this change has commenced, the circumjacent parts probably contribute to its completion, by furnishing an additional fluid which favours the decomposition of the tubercle; but the change is originated, as an intrinsic and characteristic one, in the tubercular material itself; commonly commencing in the interior of its concretion, where the product is of oldest formation, and where the influence of neighbouring tissues would of necessity be least. Its resemblance to the well-known softening of fibrinous coagula in veins is too remarkable to be overlooked—a resemblance both in the steps of the process and in its material results. This is rendered the more interesting from the obvious similarity which exists between tubercular matter and fibrin, in respect of most chemical characters and of some general physical qualities. There seems no reason to doubt that these processes are essentially identical, and that the pathological gist of scrofula consists in the deposition and ulterior deliquescence of a fibriniform material.

The often-asked question—Is tubercle an inflammatory product? seems to be answered in anticipation by the description I have already given you. In itself, it is clearly no product of inflammation, but is apt, especially at the period of its softening, to act as an irritant of surrounding textures, and to invite the addition of their inflammatory exudations. The evidence of its non-inflammatory origin—the evidence of its origin as a concretion—seems sufficiently furnished by the results of microscopical examination; and to this may be added the testimony of all clinical observers, that tubercular accumulations may advance latently, and may reach considerable magnitude or extensive diffusion, without producing in the patient any signs, local or general, of inflammatory action. It is important, however, to know that its mechanical interference with the circulation of blood is great. In the lungs—for some reason hitherto unexplained—this obstruction to the passage of blood acts peculiarly, and leads to the occurrence of hemoptysis. We do not find hemorrhage habitually associated with tubercle in other organs of the body; nor do we find that other than tubercular deposits in the lung readily induce hemorrhage there; but this particular deposit in that particular organ produces the result with extreme frequency. In the first report of the Consumption Hospital it is stated that about two-thirds of their phthisical patients suffered from hemoptysis; and in nearly three-fourths of this number the symptom in question arose *before* the occurrence of softening; when, namely, it must have depended on the rupture of blood-vessels from their mechanical obstruction, and not on their being opened by any ulcerative process.

I have now to state to you the *order of preference* in which different organs are invaded by tubercular disease; and I may take this opportunity of saying explicitly (if I have not already done so) that I look upon the scrofulous deposit, which we so often find in the glands of the neck and in other lymphatic glands, as identical with the material of pulmonary and other visceral tubercles. Both chemical and anatomical examinations establish this view (in my opinion) so conclusively, that I am quite unable to understand how it is that some pathologists still hesitate to admit the fact. The description which I have given of yellow tubercles as it occurs in the lung, would apply with equal accuracy to scrofulous deposit in any other organ of the body.

As respects the choice of organs for scrofulous deposit, I can give you infinitely better authority than my own, in quoting the observations of Professor Rokitansky; his pathological statistics—founded as they are, on what he well calls "colossal materials," can be equalled from no other source. The annual necropsies in the General Hospital at Vienna probably exceed at least twenty-fold those which occur yearly in any one of our large London hospitals; and Rokitansky's great name has been connected with this unique school of pathology, I believe, during twenty years. In summing up figures for such statistical deductions as I am about to give you, his materials must consist of more than *tens of thousands* of instances. The following, then, on his authority, I give you as the order of frequency with which different organs are found tubercular in the dead body:—Lung; intestinal canal; lymph-glands, especially the abdominal and bronchial; larynx; serous membranes, especially peritoneum and pleura; pia mater; brain; spleen; kidneys; liver; bone and periosteum; uterus and Fallopian tubes; testicle and its appendages; spinal marrow; voluntary muscles; and, in children, this order of precedence so far undergoes a modification, that the lymph-glands and spleen stand first in the list.

But, in order to be rendered a true transcript of nature, this list requires a very important qualification. It confounds together the primary tubercular deposits with those which have occurred as secondary formations, during the fatal progress of the disease; counting (for instance) tubercular ulceration of the intestines as an unit for the statistical table, whensoever it is found in the dead body, although perhaps it may never have been discovered, except as a posterior complication of other tubercular disease. The important question obviously is this,—by what organ does scrofula first possess itself of the system? not—what organs are oftenest found tubercular in post mortem examinations, where several organs are simultaneously seen to be diseased? but—what organs are selected by nature for the first invasion of the disease? what organs give the greatest facilities for its characteristic deposit? Hear Rokitansky again:—The lungs and the lymph-glands still maintain, in a very high degree, their numerical superiority to all other organs affected singly; while the intestines, larynx, and trachea, serous membranes, spleen, and liver, fall at once from the high level at which they stood in the less discriminative list; they fall so low, as to indicate, conclusively, that they are almost, or quite, insusceptible of the primary invasion of tubercular deposit:—that they suffer only in a secondary way, and are visited (so to speak) only by the superfluities of the disease.

This is matter of immense importance. The organs, in which the disposition to primary deposit almost exclusively prevails, are such as may, with equal exclusiveness, be called the *organs of blood development;* and in this generalization we possess a clue, which it is impossible to over-estimate, for arriving at a true interpretation of this fatal disease.

We have next to inquire, respecting the several organs in which tubercle occurs—what anatomical relation is borne by the morbid deposit to the natural tissues of the organ.

In the lymph-glands, I suspect that tubercle is in truth no *deposit*; that it is not derived from the blood in the vessels there ramifying, but is an accumulation in the tubes of the gland of their own morbidly coagulable or inspissated lymph; that it is therefore not, strictly speaking, a disease of the lymph-gland, but of the lymph in the glands.

As respects other organs, it seems that the readiness with which the tubercular material coagulates, prevents its passing to any distance from the vessels which have furnished it. Accordingly, we do not find it occurring in tissues which derive their nourishment by imbibition through some length of extravascular structure, as cartilage. But in organs which consist of involuted mucous membrane, with a more or less solid plexus of blood-vessels, we find that the deposit readily concretes on the free surface of the membrane; thus, in the lungs, it may be seen to lie as a secretion in the air-cells, till it has collected in sufficient quantities to obliterate their septa, and microscopically to appear as what may be termed tubercular infiltration. Among the observations which illustrate the first deposit of tubercle in the lung, I have much pleasure in citing those of my colleague, Mr. Rainey; and I recommend you to read attentively the paper on this subject which he communicated to the Medico-Chirurgical Society in 1845. In other compound mucous organs I have seen the same thing; for instance, in the follicles of the uterus, and in those of the vermiform appendage; while a mash of softened tubercle has been lying over the general surface of the mucous membrane, I have been able to isolate the subjacent follicles, to see them full of apparently tubercular matter, and yet with their definite limitary membrane quite uninjured. However, while I entertain not the slightest doubt that tubercular matter concretes readily within the air-cells, on the free surface of the limitary membrane (for on many occasions I have seen it occupying this position) I should hesitate to admit that this is its exclusive seat, even in the earliest commencement of the disease. In studying injected specimens of pulmonary tubercle, one sees many nebulæ of deposit, which show no trace of sub-division according to the arrangement of air-cells, and which yet do not appear of sufficient density to have caused the destruction of membranous septa. I am not able to tell you with certainty, whether the tubercular element of the blood may coagulate within the capillary vessels of the lung, and in their immediate proximity; but there are pathological reasons for considering this as not improbable, and as helping perhaps to explain the extreme power of obstruction which tubercle exercises on those vessels, and the singular tendency which it possesses, beyond all morbid interferences with the pulmonary circulation, to produce the symptom of hemoptysis.

Likewise, among anatomical peculiarities of this deposit may be mentioned, that in almost every organ there is a favourite spot, where the masses of tubercle first appear. Thus, in the lungs, there is the well-known preference for the summit; in the pia mater, for the region of the base, about the commencement of the optic nerve and the fissure of Sylvius; in the brain itself, for the grey substance; in the osseous system, for the cancellated structure; in the bowels, for the lowest part of the ileum; in the testicle, for the epididymis; in the female sexual system, for the Fallopian tubes and fundus of the uterus.

Next we have to inquire—What are the pathological affinities of tubercle? what disease does it refuse to co-exist with? with what diseases is it often associated?

First, for the negatives: Rokitansky, whose immense materials are again a sure resource, says: Tubercle hardly ever occurs in those who are the subjects of cystic tumours, such as those of the ovary: Bronchocele seems incompatible with it, and ague is alleged to be so: It is with the utmost rarity that tubercular patients are attacked with typhus: Tubercle and cancer are incompatible.

Lastly, I told you in a former lecture, that Rokitansky attaches great importance to an increased *venosity* of the blood, as an antagonistic condition to the formation of tubercle; and under this head he includes every influence which interferes directly or indirectly with oxygenization of the blood, either by diminishing the capacity of the chest, or hindering the expansion of the lungs, or by deranging the pulmonary circulation of blood, or by impeding the free access of air thereunto.

For example: a case of spinal deformity narrowing the chest; a case of abdominal tumour encroaching upward, and causing dyspnœa; a case of cyanosis maintaining deficient aeration of the blood; these would be cases in which, according to this observer of hundreds of thousands, the tubercular deposit would not arise.

With respect to those contrary classes of disease, with which tubercle most readily associates itself, there stand first of all, those atrophic, ulcerative, and sub-inflammatory processes, to which I have already adverted as apt to occur in depressed states of the system, and which maintain (as I explained at the commencement of my lecture) only an accidental affinity to tubercle. But there is one very important class of structural changes, which the tubercular constitution so habitually associates with itself, that I can hardly refrain from considering their mutual relations important or essential. I allude to what is called the fatty degeneration of the liver, the kidney, and the arteries; and I am disposed to believe that, when our knowledge of the subject has become more complete than it now is, we shall find proof that these fatty degenerations stand in some essential relation to the tubercle-forming diathesis—stand perhaps in the relation of secondary dependence on it. You will rarely make the post-mortem examination of a tubercular patient without finding an augmented formation of fat in one, two, or all of the three situations I have mentioned: in the liver, constituting its well known fatty enlargement; in the kidney, associated with those other changes which concur with it to constitute the scrofulous form of Bright's disease; in the arteries effecting their atheromatous degeneration, weakening their coats, and disposing them to aneurism or to rupture. In the liver, this fatty deposition occurs as a very simple change, merely increasing (though often to an immense extent) that molecular oily ingredient, which is native to the endothelium of the gland, and which is visible microscopically in the form of minute globules of oil within the limits of each nucleated cell. In the artery, other changes are associated with the fatty accumulation—at least, whenever it is extreme; changes which have suggested to pathologists a suspicion that the atheromatous degeneration consists in the fatty conversion of some fibrinous or fibriniform material previously deposited there. In the kidney, likewise, at least in that of the human subject, the process of fatty accumulation (shown, as you look on the section of the gland, by a vast number of bran-like spots diffused usually over a pale and flabby surface) is far from being a simple one: you never see the kidney extensively affected in this way, without observing simultaneously that there exists some considerable destruction of tubules, or some serous or fibrinous infiltration of the gland, for which the presence of fat in its endothelium would be insufficient to account. That fatty accumulation in the kidney, confined to its endothelium, and existing there as a primary deposit, constitutes the proximate cause of the scrofulous form of Bright's disease, is a view which I cannot consider supported by conclusive evidence. Many of the microscopical forms (some derived from the tubules during life, others from sections of the organ after death) which have been ascribed to fatty engorgement of the endothelium, are indistinguishable from the *glomeruli* which arise in fibrinous and bloody effusions, and which (as in the white substance of the brain) are often met with in parts not naturally possessing a nucleated cell-growth.

In the domestic cat—at least in our metropolitan cats—the tubules of the kidney almost invariably (though I presume abnormally) contain a very large quantity of oil; and I think it probable that this quantity may artificially be increased by interference with the locomotion and respiration of the animal. This is a condition of simple fatty accumulation, analogous probably to the fatty liver of the human subject. Though immeasurably greater in degree than any similar accumulation ever observed in the human kidney, it is attended by no destruction of the tubules; nor does it often, if ever interfere with the function of the organ or with the health of the animal. Some years ago, too hastily, I believed that these kidneys were exquisite analogies of our scrofulous form of Bright's disease, and would explain its human pathology: but further investigation has convinced me of the inaccuracy of this first impression.

Let me now, in a few paragraphs, collect for you the total result of our present knowledge of tubercle, and state to you what inferences may be drawn as to its true pathology from those extensive generalisations which I have set before you.

The material products of the scrofulous diathesis consist in some mis-developed proteinous ingredient of the lymph and blood. The essence of this mis-development lies in the fibriniform solidification and concretion of something which should remain fluid in the plasma of the blood. I call it fibriniform, because—though it is not identical with fibrin, it probably arises in some analogous method of formation, and undergoes similar final metamorphoses. This solidification occurs in the ascensive development of the lymph and blood; it occurs with an infinite preference in the lymph-glands and in the lungs;—in the former, where lymph is brought into intimate relations with arterial blood; in the latter, where lymph (which is constantly accruing to the blood) first comes into immediate relations with the atmosphere. It seems then to affect the total blood, only by reason of the lymph which is contained in it; in other words, not to be a disease of the total blood, but one of the lymph or nascent blood. Precipitability by the atmosphere is the characteristic of this morbid product; its places of election are determined by this peculiarity: tubercles form, where lymph and blood get their first opportunities of increased oxidation.

In accordance with this law, venosity of the blood precludes the tendency to tubercular deposition. The fibriniform product of scrofula is insusceptible of development: it is a dead concretion. Like true fibrin, it may become the seat of calcareous deposit, and may thus form a permanent inorganic concretion. Like true fibrin, it chiefly tends to soften, and its softened substance is copiously infiltrated with fat; probably it undergoes a fatty degeneration. The diathesis in which tubercular deposits occur, is accompanied by a remarkable tendency to the accumulation of fat in the liver, and to the fatty degeneration—either of the substance of other organs, or of some previous infiltration in those organs: possibly this tendency may indicate that the fibriniform material of tubercle in its molecular state can undergo, either in the blood, or in those organs, the same degenerative changes as affect it in its concrete condition. In short, the scrofulous diathesis consists in an inherited peculiarity of blood-development, under the influence of which the nascent blood tends to a molecular death by super-oxidation; partly it may appear that these dead proteinous elements can undergo, within the stream of the circulation, such degenerative changes as will qualify them for discharge by excreting organs; partly it may appear that these changes lead to fatty accumulations in the endothelium or in the parenchymatous blastema of such organs; but mainly and characteristically, it is the way of those dead proteinous elements to concrete in the organs where their precipitation has been determined, and there to construct the fibriniform masses called *tubercle*. These masses undergo changes of deliquescence and destruction, which tend to their ultimate expulsion from the system, but which as they entail the disorganization of all surrounding textures by inflammatory and ulcerative processes, are commonly defeated in this tendency when they occur in vital organs (as the lung) or attain it by the complete sacrifice of the invaded organ, as when present in lymph-glands, testicle, or breast.

I have told you that cancer and tubercle are imcompatible diseases—that the one excludes the other. You cannot wonder at this. They are pathological antitheses in regard of the blood. In the one case, if I may use so strong a phrase, the blood dies still-born; it never attains its maturity of growth or function: it stops short of the distributive arteries of the body; it never reaches the aorta; it perishes and decays on the threshold of the circulation. In the contrary case of cancer, there is an obstinate excess of vitality, which will not be quenched. You remember how the blood's plasma, as though out of a luxuriance of life, contributed—not to perishable concretions, but to profuse living growths; you remember how these growths, tending to an effort of elimination, still maintained an uninterrupted dependence on the blood, constituting the strange paradox of an organized excretion; you remember how they evolved themselves with exhaustive rapidity out of a too fructifying blastema, vegetating without limit at the expense of other organs, till the whole fluid of the circulation seems to devote itself, away from its slower and legitimate uses, to this impetuous by-play of organization.

Our therapeutical knowledge of tubercle is scanty in the extreme. We are not sure that we possess a drug capable of interfering with its deposit. Iron, which acts so powerfully on the corpuscular development of the blood, and which must therefore, in some degree, effect its total progressive changes, has acquired no reputation for the prevention of tubercular concretions. Cod-liver oil, which is said to influence materially the earlier stages of blood-development, has latterly been much vaunted as a contra-scrofulous remedy; its credit, in many cases, is well deserved, and its alleged action on the blood would seem to bring its method of operation nearer to the root of the disease; but much in all this is conjectural, and I dare only speak of it as a matter for continued observation, whether the drug does really affect the initiative acts of blood-development, and whether it does really counteract the tendency to tubercular precipitation. Of the iodide of potassium we know nothing at all; and we have only some very crude and general analogies to guide us to an impression, that its action would rather consist in disintegrating and removing the morbid product, than in hindering its first formation.

Climate, as I have already told you, has a most material influence for and against the development of tubercle. A degree of scrofulous diathesis, which would tuberculize the lungs of a patient in England, would leave him quite unscathed in Cairo, or at the Cape; and, conversely, a minor degree of the diathesis which would be harmless in a tropical climate, would determine the development of phthisis, if its subject should be made an inmate of our colder atmosphere. I cannot refrain from connecting these notorious facts with that which I have already told you, as to the anti-tubercular power of an increased venosity of the blood. The first and most essential change, wrought by the transference of an animal from England to India, is in the respiratory function, and consequently, in the oxidation of the blood. Where the thermometer stands at 90°, the quantity of respiration (owing to rarefaction of the air) must be very much less than where the thermometer stands at 45°, the blood will, consequently, be in a condition of relative venosity, and the disposition to tubercular precipitation will be *pro tanto* diminished. This, I have no doubt, is the manner in which transference to a warmer climate acts beneficially in the *prevention* of tubercular disease. More than this,—where the deposits already exist, or where the ulterior destructive changes have commenced in them, a warm and equal atmosphere can exert a palliative tendency, in diminishing the liability to those catarrhal complications which are so frequent in our precarious climate. Do not believe, in regard to your scrofulous patients, that climate will prevent the softening of tubercular masses which already exist, or that it will insure the cicatrization of cavities already formed, or about to be formed. Its power is much more limited than this; it will counteract very powerfully the disposition to further deposits; it will give nature more chance of effecting the discharge of softened tubercle in her own gradual manner, than if the process were to be complicated with constant renewals of catarrhal inflammation; and in both these respects—provided there be no large extent of vital organs diseased—it will give powerful assistance towards the patient's recovery. More than this it will fail to accomplish.—*Lancet, August* 3, 1850, *p.* 137.

34.—SPECIAL RULES TO BE FOLLOWED DURING AUSCULTATION OF THE PULMONARY ORGANS.

By Prof. Bennett.

[Professor Bennett, in his Clinical Reports, remarks:]

1. In listening to the sounds produced by the action of the lungs, we should pay attention to three things—1st, The natural respiration; 2d, The forced or exaggerated respiration; and, 3d, The vocal resonance. For this purpose, having listened to the sounds during ordinary breathing, we direct the patient to take a deep breath, and then, still listening, we ask him a question, and during his reply judge of the vocal resonance.

2. You should commence the examination immediately under the centre of one clavicle—and having ascertained the nature of the sounds and vocal resonance there, you should immediately listen in exactly the corresponding spot on the opposite side. The examination should be continued alternately from one side to the other, in corresponding places, until the whole anterior surface of the chest is explored. The posterior surface is then to be examined in like manner.

3. When, in the course of the examination, anything different from the normal condition is discovered at a particular place, that place and the parts adjacent should be made the subject of special examination, until all the facts regarding the lesion be ascertained.

4. It is occasionally useful to tell the patient to cough, in which case we are enabled to judge, 1st, Of forced inspiration, as it precedes the cough; and, 2d, Of the resonance which the cough itself occasions.

Of the Sounds elicited by the Pulmonary Organs in health and in disease.—I am anxious to impress upon you, that the sounds which may be heard in the lungs are like nothing but themselves. Students are too apt to take up erroneous notions from reading on this subject, and instead of listening to the sound actually produced, fatigue themselves in a vain endeavour to hear something like crackling of salt, the rubbing of hair, foaming of beer, or other noises to which these sounds have been likened. Preconceived notions frequently oppose themselves to learning the truth, and have to be got rid of before the real state of matters can be ascertained. Hence the great importance of obtaining your first impressions of the sounds to be heard by auscultation, not from books or lectures, but from the living body itself.

If you listen through your stethoscope, placed over the larynx and trachea of a healthy man, you will hear two noises, one accompanying the act of inspiration, and the other that of expiration. These are called the *laryngeal and tracheal sounds or murmurs.* If you next place your stethoscope a little to the right or left of the manubrium of the sternum, you will hear the same sounds diminished in intensity. These are the *bronchial sounds or murmurs.* If now you listen under and outside the nipple on the right side, or posteriorly over the inferior lobe of either lung, you will hear two very fine murmurs. That accompanying the inspiration is much more distinct than that accompanying the expiration. By some, on account of its excessive fineness, it is stated that there is no expiratory murmur in health; but this is incorrect. These sounds, then, are the *vesicular respiratory murmurs.* All these sounds become exaggerated during forced respiration, but in a state of health they never lose their soft character. Again, if you listen in the same places, whilst the individual speaks, you will hear a peculiar resonance of the voice, which has been called, in the first situation, *pectoriloquy;* in the second, *bronchophony;* while in the third, it is scarcely audible. A knowledge of these circumstances, and a capability of appreciating these sounds, are necessary preliminary steps to the right comprehension and detection of the murmurs which may be heard during disease.

I have to suppose, then, that you have made your ears familiar with these sounds, and that you are acquainted with the present state of theory regarding their formation. This last may be stated in very few words to be, that the respiratory murmurs are occasioned by the vibration of the tubes through which the air rushes, according to well-known acoustic principles. Hence they are loudest in the trachea, finer in the large bronchi, and finest in their ultimate ramifications. The vocal resonance, on the other hand, originates in the larynx; and diminishes or increases—1st, according to the distance of any point from the source of the sound; and 2d, according to the power which the textures have in propagating it.

If now you examine, in succession, any six of these cases in the wards which are labouring under well-marked pulmonary diseases, you will have no difficulty in recognising that all the sounds you hear may be classified into two divisions—1st, alterations of the natural sounds; 2d, new or abnormal sounds, never heard during health.

I. *Alterations of the Natural Sounds.*—All the sounds of which we have spoken, which can be heard in the lungs during health, may, in certain diseased conditions, be increased, diminished, or absent; their character or position may be changed; and with regard to the respiratory murmurs, they may present alterations in rhythm, or duration with respect to each other.

Alterations in Intensity.—Some persons have naturally louder respiratory murmurs than others; if this occur uniformly in both sides, it is a healthy condition. Occasionally, however, the sounds are evidently stronger in one place, or on one side (*puerile respiration,*) generally indicating increased action of the lung, supplementary to diminished action in some other part. In the same manner, there may be feeble respiration simply from diminished action, as in feeble or old persons, but it may also be occasioned by pleurodynia, obstructions in the larynx; trachea, or bronchi—pleurisy, or pulmonary emphysema, or exudations filling up a greater or less number of the air-cells and smaller tubes, as in pneumonia, phthisis, &c. Complete absence of respiration occurs when there is extensive pleuritic effusion of hydrothorax.

Alterations in Character.—The various respiratory murmurs may, in certain conditions of the lung, assume a peculiar harshness, which, to the ear of the practised auscultator, is a valuable sign, indicative of altered texture. Thus in incipient phthisis the vesicular murmur under the clavicle is often *rude* or *harsh*. In pneumonia the bronchial respiratory murmur presents a similar character. When ulceration exists, it becomes what is called *cavernous* (hoarse or blowing); and in certain cases of pneumothorax with pulmonary fistula, it assumes an *amphoric* character.

Alterations in Position.—It frequently happens that the sounds which are natural to certain parts of the chest, heard distinctly where in health they are never detected. Thus, in pneumonia, *bronchial or tubular breathing,* as it is sometimes called, may be evident, where only a vesicular murmur ought to exist. This is often well marked with regard to the vocal resonance, as certain lesions, which occasion condensation or ulceration, will enable us to hear in parts where, under ordinary circumstances, no voice can be heard, either bronchophony or pectoriloquy.

Alterations in Rhythm.—In health, the inspiration is usually three times as long as the expiration. In certain diseased conditions this relation is altered, or even inverted. In incipient phthisis we often find the expiration unnaturally prolonged. In chronic bronchitis and emphysema it is three or four times longer than the inspiration.

II. *New or Abnormal Sounds.*—These are of three kinds; 1st, rubbing or friction noises; 2d, moist rattles; 3d, vibrating murmurs.

1. *Rubbing or Friction Noises* are caused in the pulmonary apparatus by some morbid change in the pleuræ, whereby, instead of sliding noiselessly on one another, they emit a rubbing sound. This may be so fine as to resemble the rustling of the softest silk, or so coarse as to sound like the creaking of a saddle, grating, rasping, &c.; and between these two extremes you may have every intermediate shade of friction noise. This variation in sound is dependent on the nature of the alteration which the pleuræ have undergone. If covered with a softened thin exudation, the murmur will be soft; if it be tougher and thicker, the sound will be louder; if hard, dense, and rough, it will assume a creaking, harsh, or grating character, &c., &c. These noises are heard in the various forms of pleurisy.

2. *Moist Rattles* are produced by bubbles of air traversing or breaking in a somewhat viscous fluid. This may occur in the bronchi, when they con-

tain liquid exudation, mucus, or pus, or in ulcers of various sizes. They may be so fine as to be scarcely audible (when they have been called *crepitating*), or so coarse as to resemble gurgling or splashing, when they have received the name of *cavernous*. Here again, between these two extremes, we may have every kind of gradation, to which auscultators have attached names such as *mucous*, *submucous*, *subcrepitating*, &c., &c. With these names you need not trouble yourselves; all that it is important for you to recognise is, that the sound be *moist*, and you will easily recognise that the rattles are coarse or large, in proportion to the size of the tubes or ulcers in which they are produced. These rattles may be heard in pneumonia, phthisis pulmonalis, bronchitis, pulmonary apoplexy, &c., &c.

3. *Dry Vibrating Murmurs* arise when the air-tubes are obstructed, constricted, or lose their elasticity and become enlarged, whereby the vibrations into which they are thrown by the column of air, produce sounds or tones of an abnormal character. Hence murmurs may be occasioned of a fine squeaking (*sibilous murmur*), or of a hoarse snoring character (*sonorous murmur*), and between the two extremes, there may be all kinds of variations, to which ingenious people have applied names. These only cause confusion; all that is necessary, being to ascertain that the murmur is *dry*, and you will easily understand that the fineness or coarseness of the sound will depend on the calibre of the tube or cavity thrown into vibrations. They are usually heard in cases of bronchitis and emphysema. Occasionally they present a blowing character, as when ulcers are dry, which often occurs in phthisis.

The *vocal resonance*, besides undergoing the changes already noticed in intensity, character, and position, may give rise to abnormal sounds. Occasionally it presents a soft reverberating or trembling noise, like the bleating of a goat (œgophony.) The value of this sign, as indicative of pleurisy, was much overrated by Laennec. At present it is little esteemed. Sometimes the resonance gives rise to a metallic noise, like dropping a shot into a large metallic basin, or the note produced by rubbing a wet finger round the edge of a tumbler or glass vessel. This is often best heard immediatly after a cough, in cases of pneumothorax, or large tubercular excavations of the lung. Œgophony is supposed to be produced, when a thin layer of serous fluid between the pleuræ is thrown into vibrations. The cause of metallic tinkling has created great discussion; but Drs. Spital and Skoda have shown that the existence of air in a cavity which is thrown into vibrations is the necessary condition.

Such, then are the principal sounds which may be heard by auscultation of the pulmonary organs in health and during disease. Many writers have endeavoured to point out their diagnostic importance, and drawn up rules which have always appeared to me much too arbitrary. Indeed in so far as the education of medical students is concerned, I have long been persuaded that the study of these rules has retarded their powers of diagnosis, and aftewards led to dangerous errors in practice. I know of no dogma, for instance, more mischievous than the one which asserts a crepitating (that is a fine moist) rattle to be pathognomonic of pneumonia, because it is just as common in phthisis, and is frequently heard in various other lesions of the pulmonary organs. Hence, we should regard a crepitating rattle, not as indicative of this or that so-called disease, but simply of fluid in the smaller air-passages; increased resonance of the voice, as indicating hollow spaces with vibrating râles, or increased induration of the pulmonary textures, and not as diagnostic of phthisis, pneumonia, &c., and so on. I wish, then, strongly to impress upon you—

1st. That the different sounds are only indicative of certain physical conditions of the lung, and in themselves bear no fixed relation to the so-called diseases of systematic writers.

2d. No single acoustic sign or combination of signs, is invariably pathognomonic of any certain pathological state,—and conversely, there is no pathological state, which is invariably accompanied by any series of physical signs.

3d. Auscultation is only *one* of the means whereby we can arrive at a just diagnosis, and should never be depended on alone.—*Monthly Jour. of Med. Science, Nov.* 1850, *p.* 444.

35.—PATHOLOGICAL STATES OF THE LUNG CONNECTED WITH BRONCHITIS AND BRONCHIAL OBSTRUCTION.

By Dr. W. T. Gairdner, Pathologist to the Royal Infirmary of Edinburgh.

[Dividing his subject into two parts, Dr. Gairdner discusses in the first, the effects which follow accumulation of mucus and inflammatory products in the bronchial tubes, causing serious obstruction; and in the second, the secondary and more permanent disorganizations of the pulmonary texture which result from the former under peculiar circumstances. The characters of the secretion from disordered mucous membrane vary very greatly. In the earlier stages the mucus is profuse, thin, watery, and frothy, mixed with air-bubbles of all sizes. At a later period the mucus has become yellowish and mixed with pus corpuscles, and occasionally it is composed of pus nearly pure, but always viscid and thick; but in these cases of pulmonary tissue is rarely unaffected.]

When the disease has been of considerable duration and has nevertheless been the result of an acute attack, there are usually found, on incising the bronchi, numerous yellowish pellets, or irregular flocculent masses of somewhat curdy consistence, which float in the more recent and thinner mucus, without in any degree becoming amalgamated with it. These masses are found of all sizes, and constitute a well-known form of the expectoration of bronchitis in its advanced stages. They are no doubt formed by the evaporation of the more fluid parts of the mucus, in consequence of the constant passage over it of dry air; the inspissated material clinging to the walls of the air passages, until detached and washed away by renewed exudation from the mucous membrane. Such a mass is not unfrequently seen plugging the whole calibre of one of the larger or smaller bronchi, in such a position as to leave no doubt that in the act of inspiration it must have acted the part of a ball-valve, completely preventing the access of air to the part of the lung involved, by falling back upon the orifices of the smaller bronchi, into which its size would prevent it from entering.

When bronchitis, or bronchial catarrh, has existed for some time in a comparatively slight form, and with the expectoration only of an increased quantity of mucus unmingled with pus, portions of this secretion become inspissated in the form of a thick, glairy tenacious, semi-transparent material, sometimes resembling raw white of egg. In one or two cases, I have pressed out of the smaller bronchi plugs of altered mucus of a still more tenacious character, like cold glue, and nearly, if not quite, transparent. But this amount of inspissation is not common.

The effects of these morbid accumulations in producing obstruction of the bronchial tubes are well known to the auscultator. So long as the mucus is thin and watery, or even more or less purulent, there is no serious or complete impediment to the passage of air; which, as the fine and coarse mucus râles, accompanied by vesicular respiration, indicate, finds its way through the fluid to the ultimate bronchial and pulmonary vesicles. The fluids, too, at this stage, move freely throughout the bronchial tree even to its minutest branches, and when in excessive quantity, are readily expectorated in the act of coughing. This stage of bronchitis, therefore, is comparatively little apt to be accompanied by urgent dyspnœa, or by changes in the condition of the pulmonary texture.

It is otherwise, however, when after a time the secretions within the bronchial tubes have become inspissated; the mucus having either become purulent and formed itself into the tenacious pellets above-mentioned, or assumed the stringy, tenacious consistence proper to the more chronic forms of the disease. When, under these circumstances, expectoration is hindered, either by the tenacity of the mucus itself, the weakness of the patient, or any other cause, the tubes become really obstructed, the sound of vesicular respiration is at some points of the lung much diminished, or it may be, altogether lost, and the bronchial râles are correspondingly modified, indicating the passage of a smaller quantity of air with a much greater amount of resistance; the ordinary mucus rattles being supplanted in part by the sharp "clicking" and valve-like sounds so well described by Dr. Williams.

It is quite evident to the observer of a patient in this condition, or indeed, in any stage of bronchitis attended with laborious breathing, that the chief difficulty is invariably in *inspiration*. This act is accomplished only with the aid of all the accessory muscles; and, even then, the contracted state of the chest, especially in children, and the imperfect descent of the diaphragm, show that in proportion to the power employed, the amount of air entering is small. The expiratory act, on the contrary, is always accomplished with comparative ease; and any serious obstruction to the performance of this act is at once got rid of, or dislodged, by the additional impulse given to the expired air in coughing or hawking. These phenomena of laborious breathing, particularly the long-drawn, exhausting, inadequate inspiration, are probably quite peculiar to obstructive bronchitis. They occur, it is true, in diseases of the heart; but in them, I believe, only secondarily, from the accumulation of mucus in the respiratory passages. The dyspnœa of *pure* pneumonia, on the other hand, is something quite different, being a mere *acceleration* of the respiration without any of the heaving or straining inspiration observed in bronchitis, or in cases where the two diseases are combined. So much is this the case, that I have repeatedly observed patients affected with a great extent of pneumonia in both lungs, and in whom the extreme lividity, and the respirations numbering 50 or 60 in the minute, showed infallibly the amount to which the function of the lung was interfered with: and who nevertheless lay quietly in bed, breathing without any of the violent effort, or the disposition to assume the erect posture, so constantly accompanying the more dangerous forms of bronchitis. If this freedom from orthopnœa and laborious breathing be not uniformly characteristic of true pneumonia, it is because that disease comparatively seldom exists, as is well known, uncomplicated by some degree of bronchial affection.

The cause of the inadequate and laborious inspiration in bronchitis while the expiration is comparatively easy, is to be found, I believe, not merely in the smaller power of the inspiratory muscles to dilate the chest, nor in the advantage which the expiratory forces derive in the dislodgment of obstructive mucus from the sudden impulse of coughing, but in the mechanical relations of the tenacious inspissated mucus to the calibre of the bronchial tubes.

There can be, I think, little doubt that many of the paroxysmal accessions of dyspnœa in persons affected with bronchitis are due to accidental change of position of the pellets and ropy masses of inspissated mucus, which accumulate in the tubes. At least stethoscopic examination frequently reveals the signs of obstruction in particular parts of the lung, supervening rapidly, and disappearing again with equal suddenness, in consequence of the accession of cough.

[The condition of the pulmonary texture springing more directly than any other from obstruction of the bronchi, by mucus of a certain degree of tenacity, Dr. Gairdner is led to believe is collapse of the air-cells. He states, that during the epidemic fever which prevailed in Edinburgh in 1847, it was frequently observed that the lungs in persons of all ages were the seat of a peculiar form of condensation, the section being smooth, not granular; consistence somewhat tough, not breaking down under the finger. These appearances occurred very commonly in typhus fever, or in the abdominal form, commonly known as "typhoid," accompanied by intestinal ulceration. Dr. Gairdner says that the result of his observations was, that this state was not connected with any form of morbid deposit, but was in its purest form, a condition of imperfect expansion or collapse of the pulmonary tissue, similar to that described in the lungs of infants, under the name of atelectasis. He says,]

Observations made in the years 1848-9 left me no longer in doubt, that the lungs of adults not unfrequently display portions more or less limited or diffused, which are so perfectly condensed as to sink rapidly in water, and yet differ widely, in appearance and microscopic character, from truly inflamed lung, as well as from all the atrophic conditions of the organ which can be clearly traced to inflammation or structural disease as their cause. In some instances, such portions presented exactly the appearance of fœtal lung; and only the manifest absurdity of the proposition could have prevented the observer from ascribing their state to the same cause as the congenital non-expansion of the lung, or atelectasis of Jörg. In the absence, therefore, of any manifest explanation of the compression or collapse of the tissue observed in these cases, I was obliged, provisionally, to rest satisfied with the knowledge of the fact that most of the lobular and many of the more diffused forms of condensation usually ascribed to pneumonia, in the adult as well as the child, were really the result of some other and unknown condition.

Some time after this collapsed condition of the lung had become tolerably familiar to me, the following case occurred, presenting a marked example of the coincidence of the affection with obstructed bronchi, *both lesions being limited to a very small and circumscribed space in the lung.*

Case I.—*Lobular Collapse of Lung—Obstructed Bronchi.*—A man, æt. 18, affected with necrosis of the femur, anasarca, and some degree of abdominal dropsy from disease of the liver, spleen, and kidneys, died in the surgical hospital in the last stage of exhaustion and emaciation. No pulmonary symptoms had attracted notice.

The lungs were generally normal in appearance. At one or two places, however, they crepitated imperfectly over spaces not larger than an inch in diameter; these portions were quite circumscribed by abrupt margins; the bronchi leading to them yielded on pressure a very tough gelatinous mucous (like thick calves'-foot jelly), which contained only ciliated epithelium, and had otherwise the ordinary appearance of mucus under the microscope.

In this case there was little or no room for fallacy in judging of the connection of the pulmonary collapse with bronchial obstruction. The parts affected, with the bronchi leading to them, were quite capable of being isolated: and there was no trace of an inflammatory affection in any part of the pulmonary tissue. The co-existence of the collapse with bronchial obstruction thus accurately limited, could only, in all probability, be explained by the dependence of the one upon the other as its cause. The following case, however, which occurred during the present year, is still more conclusive.

Case II.—*Extensive Collapse of Lung—Obstruction of Bronchi by a Tubular Membrane.*—A girl, aged about 21, was attacked, after a surgical operation upon the tongue, with urgent dyspnœa having the character of a laryngeal affection. Tracheotomy was performed, but failed to save her. She died about twenty four hours afterwards.

Dissection performed Feb. 22, 1850. The appearances in the air-passages and lungs were the following:—

The right lip of the glottis was infiltrated with serum, which distended the epiglottidean fold of mucous membrane so much as nearly to close the opening. The larynx and trachea were occupied by a tubular false membrane throughout their whole length; it was about a line in thickness, friable, and of a yellowish white colour. This membrane was continued at the bifurcation into the right bronchus, but the left was free from it. It could be traced throughout the bronchi of the right lung even into the minuter ramifications, in which it assumed the form of a very soft opaque matter, like a thick emulsion. On examination with the microscope, the membrane presented the usual appearance of coagulated fibrin, with some pus or mucus copuscles, but these not in very large numbers.

Both lungs were more collapsed, and contained less air than natural. The left, however, was much less affected than the right. The latter was at some parts completely flaccid and free from air, while others presented an imperfect crepitation. The upper lobe crepitated more than the others, and its colour was mostly natural; but in its lower portions it approached more in colour to the middle lobe. This was perfectly non-crepitant, of a grey colour, having a smooth flesh-like section, and infiltrated with a thin serosity, having a faint reddish tinge, nearly transparent, and presenting under the microscope only epithelium, pigment cells, and a very small amount of pus cells, and granular matter. The lower lobe was not quite so much compressed, and contained a good deal of blood. The bronchial glands were slightly enlarged, and the whole pulmonary mucous membrane highly vascular.

In this case, as in the former, there were no pneumonic appearances; for the small amount of pus cells which existed in the serosity scraped from the lung, we probably derived from the small bronchi, and were, at any rate, quite inadequate to account for so remarkable a consolidation. Neither can it be supposed that there was any older structural lesion of the pulmonary substance, as the girl was undoubtedly in good general health at the period of her admission into the hospital, and the whole stages of the fatal disease were too rapid to admit of any complicated structural change. The collapsed lung presented exactly the appearances so commonly seen in organs compressed by pleuritic effusion, except that the middle lobe had rather more of an œdematous appearance than is common under such circumstances. Here, then, is an instance of collapse of the entire lower lobes and part of the upper in the right lung, as complete as it could have been from external pressure, and coinciding with a manifest cause of obstruction in the whole of the bronchi of that lung; whereas on the opposite side, where the obstruction had been much less considerable, the lung was comparatively expanded and normal. It is impossible not to see here a relation of cause and effect; and as it will not be maintained that the deposit of false membrane was the result of the collapse, the converse proposition is, I think, scarcely to be avoided.

The form of bronchial obstruction in this case is a sufficiently rare one in the adult, but by no means unexampled. It is not at all clear whether the membrane had never formed in the bronchi of the opposite lung, or had been dislodged by expectoration. In the former case it is not easy to understand the non-symmetrical character of the fibrinous exudation, while the mucous membrane appeared equally inflamed on both sides of the chest; in the latter it is still more incomprehensible, how the complete expectoration of an extensively ramified membrane could take place, without being observed during life. But of the fact of its presence on the right, and its entire absence on the left side, there is no doubt.

The observation of these two cases, and the conclusions which appeared naturally to follow from them, as to the connection between collapse of the air cells and bronchial obstruction, tended to throw light on many of the obscurities of the preceding observations. More particularly, it seemed to me that they furnished the connecting link necessary for the explanation of the peculiar forms of "lobular pneumonia" (as they were generally considered), which had frequently occurred both in the lungs of children and adults. The peculiar connection of lobular condensation with bronchitis was a matter of common observation with me before this period; the more recent literature on the diseases of the lung in children also seemed to point to the same fact; and it seemed every way probable that many of the more complex phenomena of pulmonary disease, would receive explanation from the more careful consideration of their connection with obstructed bronchial tubes. I therefore renewed my observations with great interest, directing them particularly, and with more care than formerly, to the relative condition of the bronchial tubes and pulmonary tissue, in all cases where either pulmonary collapse or bronchitis existed to any considerable extent. The general result to which I have been led is, 1st, that in all cases of collapse of the lung not caused by external pressure, the bronchi have presented unequivocal appearances of obstruction; 2d, that in most, if not all, the instances of severe and fatal bronchitis, especially if the secretions have become ropy or inspissated, more or less collapse of the pulmonary texture has also been present; 3d, that under peculiar circumstances a much less amount of obstruction may be attended with collapse of the pulmonary texture, the symptoms in such cases probably attracting little attention.

In maintaining (as I have no hesitation in doing) that some degree of collapse of the lung is an almost invariable concomitant of bronchitis of a certain degree of intensity, it must not by any means be supposed that *complete* loss of crepitation is to be looked for in any part of the tissue in the majority of cases. The usual fact is, that the collapse is in the incomplete and diffused form; but I believe, nevertheless, that dulness of percussion during life from this cause, and complete lobular or diffused collapse after death, especially in the posterior parts of the organ, will be found to be much more common in the bronchitis, as well of adults as of children, than is commonly supposed.

Of the truth of these opinions, both recorded observations, and unrecorded recollections, appear to me to furnish no inconsiderable amount of evidence.

[On the opinions of Dr. West upon this subject, the author observes:]

The descriptions of Dr. West well deserve to be read, on account of their clearness and accuracy of detail; and his views as to the frequent connection of the collapse of the lung with bronchitis, and its dependence in many cases, on that affection, harmonize so closely with my own, that I can scarcely regret the late period at which I became acquainted with them, as it enables me to point out more clearly the identity of the conditions in the adult with those in the child. "In the child," says Dr. West, "nothing more is needed than a copious secretion of mucus into the bronchi, or a feeble condition of the vital powers, to prevent the air from freely entering the pulmonary vesicles, and thus to induce the collapse of a large portion of the lung."

[Having endeavoured to show that among the pathological phenomena connected with obstruction of the bronchi with tough mucus, or other inflammatory products, one of the most frequent and important is collapse, to a greater or less extent, of the air vesicles, to which the obstructed bronchi lead. Dr. Gairdner then proposes to show the probable dependence of many important chronic alterations of the pulmonary texture on the condition of collapse from bronchial obstruction. He first notices a condition which occurs so frequently in connection with it, that he considers it a secondary consequence of bronchitis, accompanied by pulmonary collapse.]

Bronchial abscess.—It not unfrequently happens that, in the centre of the collapsed lobules of a lung affected with acute bronchitis, there are found small collections of pus, varying in size from that of a hempseed upwards to double or treble that volume. These small abscesses present, on section, an appearance so like that of softening tubercles, as to be very readily mistaken by many persons for these bodies; and the resemblance is all the greater on account of the peculiar limited form of the condensation by which they are generally surrounded, which when felt by the touch from the exterior of the lung, is exceedingly deceptive. In their interior, however, these little abscesses contain, in the recent state, a very fluid pus; moreover, they are often met with as acute lesions produced by a few days of illness, and without a trace of tubercle in any other organ.

This is peculiarly characteristic in the young child, in which tubercle of the lung so very rarely occurs without extensive deposits in the bronchial glands, whereas the present lesion is accompanied in its pure form by nothing more than slight enlargement, when the pus contained in these abscesses, in their recent form, is pressed or scraped out, they are seen to be lined with a fine villous false membrane, very different from the thick curdy mass which generally surrounds softened tubercles; in others they are not abruptly limited at all, the pus appearing to lie in contact with the surrounding pulmonary tissues. When the bronchi leading to the lung so affected are carefully incised, they are found much inflamed; the mucous membrane vascular, thickened, and covered with pus; and some of the bronchi thus affected can be observed to communicate with these purulent collections, the mucous membrane having evidently been, at the point of communication, destroyed by ulceration, and either stopping short abruptly, or becoming gradually incorporated with the false membrane lining the abscess. Sometimes these abscesses are found to break into one another, and form more considerable excavations; in one instance I found them connected with a gangrenous condition; more commonly, however, they remain of limited size, preserving perfectly the direction and relations of the bronchial tubes.

These abscesses occur in the diffused as well as in the lobular form of condensation from collapse; and both forms may sometimes be seen in the same lung. A similar lesion may accompany true pneumonia, but always in those cases where it is combined with intense bronchial inflammation. In this case, also, it tends to the formation of more considerable and more irregular excavations.

Such cavities have been pretty accurately described by Barthez and Rilliet (as well as by other French writers on the bronchitis and pneumonia of children,) under the name of "*vacuoles*." They are, however, far from uncommon in adults, though, perhaps, more frequent in the so-called "lobular pneumonia" of children. As these "vacuoles" unquestionably arise from the accumulation of pus primarily in the extreme bronchial tubes of the collapsed lobules, the name of bronchial abscesses may serve to distinguish them from other forms of excavation of the lung.

That Laennec should have overlooked these small excavations is singular enough. Probably he may have considered them a form of tubercle, a term which has been used by him and others with sufficient vagueness to cover a multitude of anomalous lesions. His assertion that in many hundreds of pneumonic lungs, he had only met with collections of pus five or six times, can only be explained upon this principle. It is, indeed, quite true that in simple pneumonia there is little tendency to the formation of abscess, the pus escaping rapidly by the pervious bronchi; but as we have seen that Laennec has probably confounded the pneumonic with the bronchitic condensation, I think it also probable that he has not distinguished the bronchial from the tubercular abscess, especially as these lesions often resemble each other so much as to have led me habitually, for some time to call the former *tuberculoid disease* of the lung.

In the child, owing to causes which will be presently mentioned, collapse, in its most complete form, very readily occurs under all circumstances, as a consequence of acute bronchitic attacks. In commenting upon this peculiarity, Dr. West, whose opinion on this subject I have before referred to, remarks that it is by the collapse of the lung "that we must explain many of the instances in which urgent dyspnœa, and all the symptoms of serious pulmonary disease, have developed themselves in the course of a few hours out of what had seemed to be a severe cold, or a bronchitis of moderate intensity. This, too, accounts for the occasional supervention of dulness on percussion, and of bronchial respiration in the child; so that you may discover them in the morning in a situation where, overnight, the percussion was good, and no sound of graver import than large crepitation." To this remark I would only add, that dulness on percussion supervening under such circumstances is not necessarily attended with any increase of fever; and that careful attention to the state of the patient in this respect may be in some cases the only mode of forming an opinion with any degree of accuracy as to the presence or absence of true pneumonia in a case of bronchitis. Of this fact a striking instance occurred to me lately in the case of a little boy, three years old, whom I attended during an attack of acute bronchitis. He was a delicate child, and had suffered several times from bronchitic attacks. His chest presented a good deal of deformity, particularly on the left side, of the kind called "pigeon-breast." On the fourth day of the attack, which had all the usual acute characters during the first three days, decided dulness on percussion, with obscurity of respiration, appeared in the right back; the dyspnœa continuing considerable, but *the fever rather abating than increasing*. Under the influence of an emetic, and a forced decubitus on the opposite side to that on which the dulness existed, almost every trace of it had disappeared in thirty-six hours, and the dyspnœa was entirely relieved.

If these views be correct, they cannot be without practical importance. The rules both of diagnosis and treatment, in regard to bronchitis and its complications, must probably undergo some modifications, in order to be safely followed. Such an axiom as the following, at least, which is one very generally conceived to be unquestionable, will not, I believe, stand the test of renewed observation, if the fact of collapse of the lung from bronchial obstruction be kept in view. "The stroke-sound of the chest," says Dr. Williams, "is not materially impaired by catarrh; and, accordingly, the partial suspension of the breath-sound in a part of the chest in this disease *cannot be mistaken for that caused by hepatization*." The reader will at once perceive that the clearness of the stroke-sound here alluded to is not always, perhaps not even generally, to be expected under such circumstances; nor can the opposite condition, even when combined with diminished or suppressed respiratory murmur, or with bronchial respiration, be allowed necessarily to indicate hepatization, The judicious physician has doubtless often been saved from error in the application of his remedies in this, as in many other cases where an unsound pathology has prevailed, by adhering to the great principles of our art, and the teaching of personal experience, rather than to receive formulas and rules on matters of detail.

But it is difficult to escape from the conviction, that the influence of a name, or the vanity of an *exact* diagnosis, may have misled many into such errors; and that in cases of supposed broncho-pneumonia or typhoid pneumonia, the practise may frequently have embraced blood-letting, heroic antimonials, or calomel and opium, when emetics and expectorants, with suitable stimulation, would have been better adapted to the circumstances of the case.

Since the preceding observations were in type, I have received the recent work of Dr. Fuchs, on the bronchitis of children, which in its elaborate descriptions, both of symptoms and post-mortem appearances, furnishes additional evidence of the connection of collapsed lung with bronchitis. The state of the lung, called "lobular pneumonia," by most authors, and "état fœtal" by Legendre, is regarded by Fuchs as a direct consequence of bronchitis; and its relation to bronchial obstruction on the one hand, and to the peculiarities in the infantile system on the other, is certainly more clearly stated than by any previous author.

Mechanism, causes, &c., of Bronchitic Collapse.—The object of the remarks hitherto made, in reference to this subject, has been chiefly to establish the frequent coincidence and probable relation of cause and effect between the obstruction of the bronchi and the collapse of the air-vesicles. The nature and rationale of that connection now fall to be more particularly considered.

When a bronchial tube is in any way obstructed, or much diminished in calibre, at one or more points, the question arises, what is the mechanical effect of the movements of respiration upon the amount of air thus partially imprisoned behind the obstructed part? If the obstruction be complete, of course no change can take place, at least mechanically; but in the case of its being, as it actually is, complete, it may be supposed that the inspiratory act tends to draw in more air than the expiration can expel, and consequently that the air tends to *accumulate* in the vesicles; or, *vice-versa*, that the air behind the obstruction tends constantly to *diminish* in amount, owing to the comparative inefficiency of the inspiratory act; or finally, that the forces equalise each other, and the quantity of the enclosed air *remains unaltered*.

Now, it cannot be denied that from the pathological anatomy of bronchitis, a *prima facie* case might be made out for each or all of those theories; for, although only one side of the question has hitherto been brought prominently forward in the preceding part of this paper, the reader will not have failed to remark that in several cases in which bronchitic collapse of the lungs existed, other parts of the same organs were affected with emphysema or dilatation of the air-cells. Indeed, so familiar is this conjunction of emphysema with bronchitis, as to have suggested to Laennec, long ago, the first of the three theories above mentioned as to the cause of dilatation of the air-vesicles in that disease. Again, fatal cases of bronchitis undoubtedly occur, at least in adults, in which there is no change of the pulmonary texture so marked as to afford support to either of the first two theories.

Laennec's view of the consequences of obstruction was founded on the idea of the comparative weakness of the expiratory, as compared with the inspiratory, forces. "The mucus secreted into the bronchi, in consequence of pulmonary catarrh, must, especially if it is very viscous, present a great resistance to the free passage of air in inspiration and expiration; and we shall shew, in speaking of the rale, that this resistance often goes the length of producing complete, though momentary, obstruction of a part of the bronchial ramifications. Now, as the muscles which subserve inspiration are strong and numerous, while expiration is produced only by the elasticity of the parts, and the weak contractions of the intercostal muscles, it must necessarily happen that the air, which has been forcibly driven beyond the obstruction in inspiration, will not be able to overcome it in expiration, and will be in a manner imprisoned, by a mechanism not unlike that in the butt-end (condenser) of an air-gun." I have given this passage from Laennec entire, because, notwithstanding the palpable fallacy it contains, it has been referred to, and its conclusion adopted without comment, by almost every systematic writer in this country as well as in France. The fact is, however, that though *ordinary* inspiration is more of a muscular act than *ordinary* expiration (merely because in the latter there is little or no resistance to be overcome, to which the elastic subsidence of the parietes is not adequate), yet the residual effective force for overcoming adventitious obstruction is very considerably greater in expiration. The *forced* or *muscular* expiratory act is, in fact, about one-third more powerful, as measured by its effect upon a pressure-gauge, than the extreme force of inspiration; and it is this force which is thrown into action when obstruction in the tubes is to be overcome. In the act of coughing, moreover, we find a beautiful mechanism, by which the air within the vesicles is discharged outwards at a *maximum amount* of pressure, and brought to bear with all the additional mechanical advantage of a sudden impulse, on every obstructing substance within the bronchial tree,—a cumulative provision which does not exist in the case of the inspiratory force. There can be no great difficulty, therefore, on these grounds, in coming to the conclusion, that the data of Laennec's hypothesis are quite erroneous, and that the practical efficiency of the expiration in forcing air through obstructions must be, *cæteris paribus*, far greater than that of the inspiration. I have already alluded to the fact, that this is consistent with general experience; for while the inspiratory act is always, in bronchitis of considerable intensity, attended with extreme difficulty, the expiration is never so.

The question of the origin of emphysema of the lung will be considered in the second part of this memoir, in which I shall endeavour to account for its connection with bronchitis, by referring its production to a totally different mechanism from that just mentioned. In the meantime, I would remark that in order to establish a direct relation between this lesion and bronchial obstruction, it is necessary to show not merely that emphysema occurs in connection with bronchitis, but that it occurs especially or exclusively *in those parts of the bronchitic lung where obstruction can be shown to exist.* This is the proposition which I conceive the preceding pages have tended to establish as regards bronchitic collapse, and on the ground which I have argued for the relation of cause and effect between this lesion and obstruction. In how far does emphysema fulfil these conditions?

It is well known to every one who has studied the anatomy of this pathological state, that the emphysematous portions of a lung can generally be inflated from the bronchi with the greatest ease. Indeed, so far as my own experience in this matter is concerned, I cannot recal any instance in which the pressure of the air was not found to reach the emphysematous parts with as great rapidity as the rest of the lung. In the collapsed lung, on the contrary, as I have already shown, very considerable resistance is often opposed to its inflation from the bronchi—a resistance only to be overcome by pressure many times greater than can ever occur in the vital act of inspiration. If this observation be correct, it is plain that the emphysematous parts of the lung are usually free, the collapsed parts obstructed.

All doubt, as to the real effect of a solid obstruction in the bronchi on the air in the lung is removed by the direct experiments of Mendelsohn and Traube on animals. The former inserted a leaden shot into the trachea of a dog, pushing it down as far as possible into the bronchus with a probe. In another instance he inserted a ball of paper. In both cases, the parts to which the obstructed bronchi led were red and void of air. In the former there were emphysematous portions in the other parts, and in the opposite lung. Traube's experiments were similar, but more numerous. The general result was, that the artificial obstruction of a bronchus always produced expulsion of the air from the corresponding part of the lung, which had a dark red colour, and presented the characters of collapse.

It is clear, therefore, from experiment, as well as from pathological observation, that the most usual and most direct effect of obstruction, or of diminished calibre of the bronchi, however caused, is not accumulation but diminution in quantity of the air beyond the obstructed point. It is probable that this is due in part to the comparative weakness of the inspiratory power, and that the proposition of Laennec may, therefore, correctly enough be inverted. There is also, however, another mechanical condition which comes into play in producing collapse from obstruction, especially in the case of a viscid plug of mucus, which is most commonly, in bronchitis, the source of this affection. This condition is to be found in the form of the tubes.

The bronchi are a series of gradually diminishing cylinders, dividing, for the most part, dichotomously. If a plug of any kind, but especially one closely adapted to the form of the tube, and possessing considerable tenacity, be lodged in any portion of such a cylinder, it will move with much more difficulty towards the smaller end, and in doing so will close up the tapering tube much more tightly against the passage of air, than when moved in the opposite direction into a wider space. If such a plug be placed over a bifurcation, it will, even if freely moving in the larger space in which it lies, be of sufficient bulk to fall back upon one or other of the subdivisions during inspiration, in the manner of a ball-valve upon the orifice of a syringe, and thus completely to occlude it. The consequence of this mechanical arrangement must inevitably be, that at every expiration a portion of air will be expelled, which, in inspiration, is not restored, partly owing to the comparative weakness of the inspiratory force, and in part to the valvular action of the plug. If cough supervene, the plug may be entirely dislodged from its position, or expectorated, the air of course returning freely into the obstructed part; but if the expiratory force is only sufficient slightly to displace the plug, so as to allow of the outward passage of air, the inspiration will again bring it back to its former position, and the repetition of this process must, after a time, end in perfect collapse of the portion of lung usually fed with air by the obstructed bronchus.

It is not a little surprising that this simple and clear mechanical mode of explaining the collapse should not have occurred to Dr. Fuchs, who, in accounting for the disappearance of the air in the experiments of Mendelsohn and Traube, finds himself reduced to the theory of its absorption into the blood-vessels. Surely nothing can be more superfluous than such an explanation.

Origin of Bronchial Abscess.—The mechanism of this lesion it is not difficult to explain satisfactorily. When pus accumulates in the central bronchi of a collapsed lobule, the evacuation of that pus is prevented from occurring, firstly, in consequence of the absence of the expiratory *vis a tergo*; and secondly, from the resistance opposed by the thickened mucous membrane and its secretions closing up the bronchus in front. The coats of the ultimate bronchi, therefore, softened and injured by disease, gradually give way to ulceration; and the pus, which thus accumulates in still larger quantity, may at first scarcely be circumscribed, but soon begins to be surrounded by a false membrane exactly similar to that of an abscess in any other part of the body. The continuity of this membrane with that of the original bronchus, may be either maintained from its first formation, or may be secondarily established. I believe, however, that the first of these views is the correct one; and that the bronchus acts the part of an obstructed fistulous opening, not sufficiently pervious to prevent accumulation entirely, but not permitting of its increase beyond a certain amount.

When the bronchial abscess has been of some standing, and the patency of the tube leading to it has become re-established in time to prevent its obliteration, a process of repair takes place, analogous to the cicatrization of a wound, and perfectly similar to that which is observed in all healing excavations in the lung, however formed. The false membrane which lines the cavity becomes intimately blended with the bronchial mucous membrane, and indeed comes to resemble it so closely that it is almost impossible to tell where the true mucous membrane ceases and the new structure begins.

This reparation, however, is rarely, if ever, accompanied by restoration of the perfect function and structure of the lung; and on this account it will be considered under the permanent effects of bronchitis.

The length to which these remarks on collapse of the lung have extended, can only be excused by the immense importance of this lesion in relation to the pathology of bronchitis; the whole of the organic affections following from which seem to me more or less dependent on that which has formed the principal subject of these observations.—*Monthly Jour. of Med. Science, Aug. and Sept.*, 1850, *pp.* 122, 230.

36.—VERY MINUTE DOSES OF TARTAR EMETIC IN PHTHISIS AND ASTHMA.

By M. Bernardeau.

In Vol. xxxi. of the "Bull. de Thérap.," M. Bernardeau gave an account of the great benefit he has seen derived from the administration of minute doses of tartar-emetic in the hectic of phthisis. Since that period he has used it in other stages of tuberculization, and in several cases of asthma, with excellent effects. He gives from three to six pills in the twenty-four hours, each containing 1-25th of a grain. By their use, the cough, dyspnœa, and inordinate action of the heart become calmed, and in fact all the good effects of morphia, without its inconveniences, seem to be produced.—*Bulletin de Therapeutic.—Brit. and For. Med. Chir. Review, July*, 1850, *p.* 278.

37.—PULMONARY DISEASES IN TROPICAL CLIMATES, AND THEIR TREATMENT.

By R. H. A. Hunter, Esq., Staff-Surgeon.

[Mr. Hunter glances at these diseases because they have been little noticed in works on tropical diseases, rather than on account of their superior importance. He says:]

Consumption, as we have elsewhere shown (Transactions of the Bombay Medical and Physical Society, No. 4), is a disease of moist exposed localities, without reference to latitude, temperature, or elevation, and so occurs equally in tropical as in temperate climates. Thus it is found at its minimum in the dry sheltered climate of the East Indies, whilst in the West India islands it attains nearly to is maximum. From inattention to this, very grave mistakes have been committed. Persons have frequently been sent to the West Indies on account of consumption, though this is about as reasonable (according to the above views at least) as to send those with chronic rheumatism or pleurisy to the frozen regions. It is sometimes objected, it is true, that Madeira is a good climate for the consumptive, but Madeira is not within the range of the trade winds, neither is it in "the variables," as they are called, but between these in the mildest region of the world. Madeira, too, is at no great distance (to the eastward) from the dry burning desert of Africa, whilst from the west it is completely sheltered by the mountains, only the lower south-eastern face of the island being inhabited, by invalids at least, whereas the West India islands are far in the strength of "the trades," after these have swept nearly across the whole western ocean.

[Mr. Hunter does not deem it always prudent to send the consumptive to the southern shores of England, except the summer be decidedly dry; and he says the low inland districts, as Clifton or Bath, might be better, to the sheltered localities of which he would ascribe their salubrity.]

But, he continues, the best place for the consumptive we know, and now within the reach of the wealthy at least, in thirty-five days, is Poona, under the Presidency of Bombay, as it also possesses the advantage of being as healthy as England in most other respects. Madras, too, is a good climate for the consumptive, and Bangalore (another excellent climate); but Bombay, Cannanore, and the Malabar coast generally, had better be avoided, at all events in the rainy season. In Bombay, indeed, one way and another, we met with more of consumption than in all the rest of India together twice over. It is there particularly frequent, too, among the "half castes," and those of European extraction generally, who have been brought up in India, insomuch that on our losing one of this class in the female (regimental) hospital, the late Archdeaeon Jefferies mentioned he had never known one of the girls brought up in the Byculla Orphan School reach the age of thirty, and chiefly from this cause. The regiments or detachments from the interior, also, soon lose their consumptive cases in Bombay, whether arriving as invalids or in the ordinary way of relief, and the same at Cannanore, and particularly during the moist stormy winds of the south-west monsoon.

If consumption be confirmed, however, any change only adds to the discomfort, and may hasten the event: nor would it be advisable to go to India otherwise than via Egypt, which is itself, I should say, a good climate for the Consumptive about Cairo, not Alexandria, though, it is true, we have the authority of Celsus, that the latter is preferable to Italy.—*Medical Gazette, August* 30, 1850, *p.* 367.

38.—DISEASES OF THE LARYNX.

By Dr. John Scott.

(Read before the Edinburgh Medico-Chirurgical Society, 15th June, 1850.)

[An excellent work by Dr. Horace Green, of New York, was published in 1846, in which the author describes, in a plain and lucid manner, the application of the tropical remedy for the cauterization of the larynx and pharyngeal cavity in cases of follicular disease. Dr. Scott says:]

Physicians have for many years been in the habit of applying caustic to the throat, tonsils, and uvula, in the solid and liquid form, in cynanche, scarlatina anginosa, tonsillaris, and other acute diseases. The first person, however, to apply the caustic solution to the larynx itself, was our very able countryman, Sir C. Bell. In his "Surgical Observations," he relates an interesting case, where the solution was applied in an ulcerated state of the glottis, when the patient was threatened with suffocation, and with a successful result. Another case, similarly treated by Sir Charles, is referred to by Dr. Watson. A full account of these cases will be found in the last volume of "Forbes' British and Foreign Review;" and also a description of Dr. Vance's practice, in what he calls *swabbing* the glottis, by means of the finger of a glove dipped in a caustic solution.*

In 1836, Trousseau and Belloc described the cauterization of the larynx in laryngeal phthisis, but they seem to have used it with hesitation and reluctance, and not to have appreciated the full advantages to be derived from it, preferring, in most cases, the injection by means of an ingenious syringe. It is to Dr. Green, therefore, that we owe the proper application of this treatment to a common and very troublesome form of disease, which he was the first to describe and properly discriminate.

The disease alluded to is denominated by Dr. Green follicular disease of the air-passages, as it consists of a diseased condition of the glandular follicles of the mucous membrane of the throat, larynx, and trachea. The structural changes are—inflammation, which may terminate in ulceration, hypertrophy, induration, or a deposition of tuberculous matter in the follicles themselves. This, from its frequency among the clergy in America, as well as in this country, has been denominated the clergyman's sore throat. It is a form of disease which we have all occasionally met with, and experienced great difficulty in treating. I have always been in the habit of employing the nitrate of silver, either in a solid or liquid state, or the sulphate of copper, but by overlooking the diseased state of the epiglottis and larynx, the cure was rendered more tedious and unsatisfactory, and in many cases the affection was considered as incurable, and mistaken for some more serious disease. Dr. Green's plan of treatment consists in cauterizing freely the whole diseased surfaces by a strong solution of crystallised nitrate of silver, generally from forty to sixty grains to the ounce of distilled water. The tongue is depressed, and the epiglottis brought into view by means of a jointed spatula.

The solution is applied by means of a curved rod of whalebone, to which a small piece of sponge is firmly attached. In many cases it is sufficient to cauterize the throat, and to press the sponge against the orifice of the glottis, without attempting to pass it into the wind-pipe. In other cases it is necessary to pass it fairly into the superior aperture, and down to the chordæ vocales. This is in general accomplished with little difficulty. I am aware that the possibility of doing this has been denied, but I can only say, that I have done it repeatedly, and found it to cause far less irritation than might have been expected. To accomplish this object, the sponge is carried steadily, without touching the pharynx, behind the erect epiglottis, drawn slightly forwards, and pressed steadily downwards, when it readily slips into the glottis, which is known both by the feeling of gasping, and the spasm immediately induced in the patient. The sensation is peculiar, though not painful in general. By causing the patient to inspire fully, the operation may be facilitated. The spasmodic action squeezes the fluid from the sponge, and it is thus freely applied to the diseased surface, causing an immediate and profuse discharge of mucus. It is always advisable, before passing it into the glottis, unless in very urgent cases, to apply the sponge two or three times to the throat and fauces, to educate the parts, as Dr. Green expresses it. Sometimes a difficulty arises from the swelling of the epiglottis or aperture; a few applications will remove this, and then the sponge can be passed without difficulty.

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* See also Retrospect, Part xvi., page 124, and Part xx., page 82.

It occasionally happens that the spasm is severe at the moment, but this soon passes off, and I have never seen it followed by any disagreeable symptoms. The disease to which this mode of treatment is applicable, is so fully described by Dr. Green, that it is superfluous for me to enter into much detail.

I shall not refer to the application of this mode of treatment to croup, as no case of the kind has fallen under my own observation. A work on this subject has been published by Dr. Green, where the success has been such as to warrant the operation in this very formidable disease. The same remark applies to hooping-cough, in which this treatment has also been said to be successful. The state of the tonsils and uvula ought always to be attended to, and for these, when seriously affected, excision is the only effectual remedy. There are many cases of acute disease to which this treatment may be applied, and, as already mentioned, English physicians have long been in the habit of applying the caustic to the throat in such.

In diphtherite, by the free application of caustic in solution over the whole surface, the inflammatory crust is destroyed, and a more healthy surface remains. The repetition of the application two or three times a day is required. In scarlatina anginosa I have used the sponge with good effect.

The following case furnished by my friend Dr. Brown, may illustrate its application to acute diseases:—

Case I.—J. S. S., æt. 43, strong, active, and healthy, had a severe attack of erysipelatous sore throat, which required vigorous treatment local and general. He was recovering when I was sent for, the message being that Mr. S. was dying. Meeting fortunately with Dr. Scott, he accompanied me. The patient had all the appearances of imminent death; his face expressive of intense terror and anguish; the extremities cold; the pulse hardly to be counted, from its rapidity and weakness; the breathing all but impossible, apparently from some affection at the top of the wind-pipe; the voice was gone. On looking deeply into the throat, the pharynx and top of larynx were seen of a deep red. The patient being too weak for blood-letting, and too ill for any slower means of relief, Dr. Scott applied the solution of the nitrate of silver, which he happened to have with him. He got the sponge completely into the larynx. Mr. S. almost instantly expressed by signs his relief. In the evening he could speak a little, and was able to lie down in bed, and was, in all respects, better. He was blistered, and had calomel and opium. Next morning he was much better. The sponge was again applied without any difficulty. He recovered rapidly, and has been for more than two years in perfect health, attributing, without any hesitation, the saving of his life to the sponge and the caustic.

The issue of this case was fortunate, yet I fear we cannot be always so certain of success, and must combine the practice with general treatment. Leeches, antimony, calomel and opium, or bleeding are frequently required. In the early stages of *diphtherite*, where the exudation is commencing on the tonsils and posterior fauces, I have seen the solid caustic, or the solution, arrest the disease. In the very fatal epidemic diphtherite, where sudden depression of the vital powers and death occur in a very short period, I have not had an opportunity of trying its effect. The disease, however, for which the treatment is most usually required, is follicular disease of the throat and larynx, which is a very common affection, and so frequent, that it is surprising how little attention it has attracted. It is met with in all classes, more perhaps among public speakers than others, and more frequently in males than in females.

Follicular disease is often accompanied with cough and slight expectoration, —sometimes mucous, sometimes purulent. In some cases phthisis is suspected, and gives rise to great and groundless alarm. In such a state of matters we must be guided by the stethoscope and percussion. When the chest is sound and the larynx diseased, the symptoms are referable to the latter organ, and disappear under proper treatment. The following is one of these supposed cases of phthisis :—

Case III.—Mrs. C., æt. 23, had suffered from influenza and bronchitis, from which she slowly and imperfectly recovered. There was occasionally a slight appearance of blood in the morning, cough, slight emaciation, febrile accession towards night, and great debility. The tongue was furred, the pulse quick, and the appetite defective. The chest was found healthy on examination, but the throat was swollen, red, tuberculated, and the epiglottis swollen. General treatment was resorted to, and the throat and the epiglottis touched every second day. In a fortnight the symptoms were almost gone, and the patient left Edinburgh quite recovered.

I have also met with another form of the affection, of which the following is an example :—

Case IV.—Mrs. S. had been for some years affected with hoarseness, loss of voice, and great difficulty in breathing in damp weather, so much as to prevent her lying down. The cough came on in severe fits. At times, in warm, dry weather, she was tolerably well, but liable to relapse in spring and winter. In this case there was tubercle of the throat, and slight ulceration of the epiglottis, apparently extending into the larynx. There was some difficulty in managing the passing of the sponge, and the treatment required it to be applied eighteen times. She left for a milder climate.

Dr. Green, in mentioning the causes of follicular disease, considers dyspepsia as a consequence, rather than as a cause. This is contrary to my experience, as in many instances there is dyspepsia and general derangement of the chylopoietic viscera. It may frequently, also be traced to mental anxiety, overstudy, or neglect of hygienic remedies. In all such cases the general health must be restored by sarsaparilla, iodine, quinine, and other remedial means,—a change of scene and relaxation from business are often essential. I have generally found it necessary to give a mild mercurial alterative, with some alkaline and saline medicine, for a week or ten days, at the time the local treatment was going on. In other cases, however, the general health is quite unaffected.

Case V.—Mr. C. had held a situation, which required much public speaking. About two years since the voice became hoarse and harsh. There was no cough or difficulty of breathing; a slight expectoration of mucus; pain above the sternum and under the clavicle; general health good. On inspection, small ulcers were discovered in the throat, and lower down, the fauces were denuded of epithelium, white, and covered with a thin, muco-purulent matter. The epiglottis was also thickened. On the first application of the caustic—which, however, did not touch the epiglottis—the patient felt relieved. On the second occasion, next day, I passed the sponge fairly into the glottis, without causing much irritation.

Case VI.—One of the most interesting cases of the kind I have seen, occurred quite lately. The patient was brought by my friend, Mr. Carmichael, who stated that, for more than three years, he had been liable to paroxysms of coughing, so severe as occasionally to suspend respiration, the lips becoming blue, and the patient falling down insensible, and not recovering for some time. From the violence of these fits he had been obliged to give up his business as a merchant. Every means his medical advisers could suggest were tried, without effect; and no progress had been made even in alleviation. The throat, on inspection, was found slightly tuberculated in the upper part; lower down it was seen to be in a state of ulceration, while the epiglottis was also found swollen and ulcerated. On the first application the caustic was passed into the larynx, and a fearful paroxysm of croupy breathing came on, followed by profuse expectoration, and subsequent relief. I have now applied the sponge five or six times, a little more cautiously than at first, but still into the larynx. After the third application, he informed me that he could swallow soup, which he had not done for some time. Sickness and vomiting generally followed the taking of food, but he can now, after three weeks' treatment, take any kind of food, and has gained four or five pounds in weight,—the best indication of improved health; and I trust his future progress will be equally satisfactory.

One remarkable effect of the follicular disease is the extreme mental depression which accompanies it, and a great feeling of debility and weakness. As the amendment in the throat progresses, the mind resumes equanimity, and the strength is restored.

I may likewise allude to a very interesting case, in which I had recourse to this practice with great temporary relief.

Case VII.—A late celebrated artist had been, for a long series of years, affected with hoarseness, occasional loss of voice (at the time I first saw him he could not speak), difficulty of breathing on change of weather, and a feeling on inspiration, as if there was an obstacle preventing the air from passing. There was also at times a difficulty of deglutition. The general health was not good; and he had suffered much from a variety of morbid affections. The throat was red and swollen, the epiglottis thickened and rigid. On applying the caustic solution, which was done cautiously at first, and from the long-standing of the disease, without much hope, considerable relief was obtained. About the fourth application the sponge was passed into the larynx. Violent spasm ensued, with a strong feeling of suffocation. This, however, soon passed off, and was followed by profuse expectoration, and great relief. After this the patient could lie down and breathe without difficulty. The spasmodic effect was so violent that I really had some misgivings about applying the caustic a second time. The patient, however, a man of great resolution, had none. It was applied again and again, and, though the spasmodic action always returned, it gradually became less, the voice improved, and considerable ground had been gained, when unfortunately, during the intensely cold weather of January, the patient was seized with acute sore throat and bronchitis, and all local treatment was suspended. At times there appeared some amendment. When I saw him he could only speak in a whisper. The larynx, however, was not much affected, except on one occasion, when there was so much difficulty of breathing that I contemplated laryngotomy. Next morning, however, this was gone, and the inspiration and the expiration quite free. Mr. Syme saw him along with me, and agreed that the larynx was not the organ affected. The disease was evidently bronchitis, with disease of the lung; and he sunk exhausted from that cause in April.—*Monthly Journal of Med. Science, July,* 1850, *p.* 15.

39.—AN IMPROVED MODE OF APPLYING NITRATE OF SILVER TO THE INTERIOR OF THE LARYNX AND TRACHEA.

By Dr. J. Chew Thomas, Baltimore, United States.

Every one who has tried must be aware of the difficulty of introducing nitrate of silver into the trachea or larynx, either in powder or solution, according to the plan proposed by the French Physicians.

If a piece of lunar caustic be held with moderate firmness on a small grindstone which is revolving rapidly, a very fine dust from the salt is thrown off in considerable quantities into the air. By holding the open mouth, within a few inches of the stone, and drawing in the breath, any desirable amount of the powder may be inhaled. I am not in the habit of directing more than four or five inhalations at a time. A very simple portable machine for the purpose, contained in a box, may be made by any mechanic of tolerable skill. All that is required is a stone about five or six inches in diameter, half an inch thick, on the same shaft with a small pulley, that is connected by an elastic band with a wheel, six or eight times the size of the pulley. The caustic, which should be free from copper or nitrate of potass, may be held on the surface of the stone by the hand, or a spiral spring adjusted by a screw. I have been much pleased with the effects of this method, in recent catarrh, obstinate chronic cough, and various affections of the larynx; and I have little doubt that it will be found useful in all cases where the use of the nitrate of silver is indicated.—*Lancet*, *July* 13, 1850, *p*. 53.

40.—CASE OF LARYNGO-TRACHEITIS TERMINATING FAVOURABLY AFTER TRACHEOTOMY.

By Dr. James D. Gillespie.

(Read before the Edinburgh Medico-Chirurgical Society, 19th June, 1850.)

[In this case Mrs. Donald, aged 30, about seven months pregnant on the evening of the 15th of January, 1850, after exposure to cold and wet was seized with symptoms of ordinary catarrh, to which she paid little or no attention.]

On the 20th pain in the larynx, with dyspnœa, was superadded. The difficulty in breathing gradually became more intense, but as the patient had been occasionally subject to asthmatic paroxysms, the increasing danger of the symptoms was disregarded. On the morning of the 29th, however, her husband became alarmed, and applied to Mr. Hugh Balfour for Medical advice.

He found the patient propped up in bed, unable to occupy the recumbent posture, and suffering from repeated paroxysms of severe dyspnœa. Mr. Balfour ordered leeches to be applied to the larynx, and an emetic to be immediately administered. The leeches were not obtained, but the emetic was taken, and caused violent retching, without, however, any abatement of the symptoms.

The same evening I was requested by Mr. Balfour to see the patient, as he thought it probable tracheotomy would be necessary. I accordingly saw her about midnight, when the following was her condition:—The pulse was about 100 in frequency, weak, but jerking, and every two or three minutes a paroxysm of intense dyspnœa, threatening asphyxia, occurred. On examining the fauces, the uvula and soft palate were considerably injected and swollen, and by pressing down the tongue, I was enabled for a moment to catch a glimpse of the epiglottis, projecting straight up, much thickened and enlarged. This examination caused a violent fit of coughing and dyspnœa.

As the dyspnœa was occurring in well-marked paroxysms, differing in intensity, I deemed it advisable to try the effect of antispasmodic remedies, before resorting to the extreme measure of making an artificial opening in the trachea; so a combination of sulphuric ether, with the muriate of morphia, was prescribed to be taken every half hour, till relief was experienced. Directions were given to summon me should the patient become worse.

Before daylight I was roused by an urgent message—"That Mrs. Donald was dying." On hastening to her house, I found her sitting up, tossing about in bed, gasping for breath, the pulse almost imperceptible, the countenance much flushed, the eyes protruded, and a cold profuse perspiration breaking on the forehead. Soon afterwards Mr. Balfour arrived, and we at once decided that tracheotomy was the patient's only chance of safety from impending asphyxia. Owing to the convulsive movements of the muscles attached to the larynx, and the strong contraction of the sternal portion of the mastoid muscle, which rendered the trachea deeper, careful dissection proved almost impossible. The difficulty was also augmented by the shortness and narrowness of the patient's neck, and the less than usual rigidity of the tracheal rings. During the operation, the flushing of the countenance became changed, first into purple, then a bluish lividity; the pulse entirely imperceptible; the respirations very much prolonged, not above four or five in the minute; so it was imperative to open the trachea without delay. This was accordingly done, and an opening made sufficient for the introduction of a middle sized tube. Its insertion caused violent fits of forced expiration; and by partly closing the orifice, a considerable quantity of venous blood, which had entered the trachea, was expelled. Still, however, the breathing was not so free as might have been expected, and the patient having communicated by signs the desire to say something, wrote upon a slate, that she felt there were some "pieces of skin" to come away. The friends were ordered to watch the patient vigilantly, and clear out the tube repeatedly with a feather. About noon a most violent paroxysm of coughing occurred; and her husband at last succeeded in extracting from the inner orifice of the tube a large piece of firm membranous lymph, having a semi-tubular form. Soon afterwards she was seen by me, the breathing being comparatively easy; but the patient repeated her assertion, that there was much more *skin* to come away. Pills, containing two grains of calomel with a little hyosciamus, were ordered to be taken every four hours.

Jan. 31st.—A large-sized tube has been substituted. Several smaller pieces of membrane have been coughed up during the night. The patient now first experiences pain in the chest; and examination shows, over the whole front, the existence of innumerable bronchitic râles. There is much difficulty of expectoration, resulting in the discharge of very thin viscid sputa, which speedily concrete on the sides of the tube. The pulse is 100, excited, but having little strength in it. Sixteen leeches to be applied to the upper part of the chest, the calomel pills continued, and an expectorant mixture, containing ipecacuan wine, and sweet spirits of nitre, occasionally given.

Evening.—The leeches have been applied, and the bleeding orifices encouraged to bleed freely. Pulse 120, weak. Breathing considerably relieved, but large gushes of a thin gummy fluid come from the tube. A blister to be applied over the upper part of the chest.

Feb. 1st—*Morning.*—Easier to-day; the blister having shifted during the night, has greatly extended the amount of vesicated surface; pulse 90, soft; bronchitic râles not so loud or numerous; breathing less hurried. During the night there passed through the tube a dense piece of membranous lymph. Another portion has been flapping against the end of the tube, but is not detached.

Afternoon.—Dr. Graham Weir saw her with me, and during our visit, I succeeded in detaching, with a probe bent into the form of a hook, a piece of greyish buff coloured membrane, about two inches long and an inch broad, not possessing a perfect tubular character.

Feb. 2d.—*Morning.*—Breathing continues easy. No more membrane has come away, and there are now no symptoms of any more being present. Râles in the chest more dry, and as if the ramifications of the bronchial tubes were clogged with more consistent mucus.

[From February 7th the patient progressed favourably. On the 10th, she coughed up from the throat a piece of membrane an inch long. On the 15th, the wound in her trachea was quite healed. There were bronchial râles on both sides of her chest—dry on the right side. Some swelling and tenderness was felt around the thyroid cartilage, which was relieved by sinapisms and leeches, and on the 23d she was discharged cured. Dr. Gillespie says:]

I have deemed this case worthy of record, as it appears to me to possess some features peculiar to itself, which I can scarcely find recognised in any systematic work on diseases of the trachea and larynx, nor have I been able to find cases precisely similar detailed in any of the medical journals. All the cases recorded by Louis as examples of croup in the adult, may be distinguished from what we are now considering by the primary disease commencing in the fauces and pharynx, and gradually extending downwards till it affected the larynx and trachea,—in fact, closely resembling, if not identical with, the epidemic disease known under the term of diphtherite, which has been so well described by Bretonneau. Moreover, in some of Louis's cases, the laryngitis was a secondary affection, occuring during the progress, or after the termination, of a debilitating primary disease.

Dr. Stokes has clearly pointed out the difference between the so-called primary and secondary croup; and though he does not deny the possibility of the primary affection occurring in the adult, in his work on 'Diseases of the Chest,' he has been unable to furnish any example of the disease.

Dr. Cheyne, who had most advantageous opportunities for observation, makes the following remark:—"In no part of Britain, I imagine, is croup more prevalent than in Leith and its immediate vicinity; yet, in the course of nearly fifty years of extensive practice, my father has not seen one instance of croup occurring after puberty, while he has attended many cases between the tenth and fourteenth year, both in delicate and robust children."

There is only one case which I can find in the journals closely resembling that which I have detailed above. It is narrated in the volume of the 'Lancet' for 1838, and is entitled, 'A case of Primary Laryngo-Tracheitis.'

The patient was a female, in the eighth month of pregnancy; the symptoms of impending suffocation were imminent; the child died in utero; but tracheotomy was not performed, owing to the woman having been reported to have coughed up a piece of false membrane. The autopsy showed "the epiglottis erect, hard, and wonderfully thickened, representing the fourth of a sphere, instead of a plane." The trachea was lined with a buff-coloured membrane, nearly as thick as the rings of the trachea, extending to the bifurcation; it formed a perfect cylinder, except at one point posteriorly, and at the lower part of the trachea, where there was a longitudinal deficiency. The cylinder of false membrane was free inferiorly; it was attached above." "The folds of the membrane forming the edges of the glottis were hard and swollen; the ventricles of the larynx were hardly visible, being nearly obliterated by the inflammatory thickening and exudation."

It is a subject for consideration in this instance, whether tracheotomy should not have been resorted to, as a chance of saving the patient's life. When we reflect on the obstructed condition of the glottis in acute laryngeal affections, we must at once see the extreme difficulty, if not utter impossibility, of any considerable amount of membranous exudation being expectorated through the greatly narrowed or closed orifice; and it is surely better to give the patient a chance of relief, by performing tracheotomy, than to leave him to certain and immediate suffocation. The difficulty of ascertaining whether any membrane has been formed cannot be urged as an excuse for the non-performance of tracheotomy; for if, as is now almost universally admitted, we are authorised to open the trachea, in the uncomplicated acute laryngitis, whenever the danger of suffocation becomes imminent, that operation is surely more strongly indicated, when we have reason to suspect that the obstruction of a false membrane in the larynx or trachea is superadded to the constricted state of the glottis.

These remarks will not apply to the treatment of croup in children, for many circumstances tend to render the propriety of operation in their cases much more doubtful. The lungs are so frequently seriously affected in the infantile disease, and the bronchi plugged up with adventitious membrane, that careful examination of all the features in each particular case must be made, ere we can resort to tracheotomy, even as a forlorn hope; for we should always keep in view the fact, of the truth of which every practical man must be well aware, that, when a case terminates unfavourably, after surgical interference, the fatal event is certain to be ascribed to the operation; and thus discredit may be brought on what, when employed with judgment, might prove a valuable acquistion in surgery.

That Mrs. Donald's case, though it has some features in common, cannot be strictly ranked as an illustration of primary croup, is, I imagine, sufficiently evident. I am inclined to consider it as an extension of the common acute inflammation of the larynx to the trachea, where, owing to some idiosyncrasy on the part of the patient, it assumed the form of lymphatic exudation.—*Monthly Journal of Med. Science, July*, 1850, *p*. 25.

41.—CASE OF CHRONIC EMPYEMA TREATED SUCCESSFULLY BY PARACENTESIS.

By Dr. A PEDDIE, Physician to the Minto House Hospital and Dispensary, Edinburgh, &c.

[In this case R. Neilson, aged 26, was admitted into the Hospital on the 27th Oct., 1847, recommended by Dr. Alison to Prof. Syme for the operation of paracentesis thoracis. It appeared from the statement of the patient he had laboured under pleurisy, from which he never perfectly recovered. His symptoms on admission were general debility, breathlessness, and palpitation on the slightest exertion, with cough on attempting to lie on the right side. The external appearances, with the various evidences of percussion and auscultation, left no doubt that the left side of the chest was filled with fluid, and on the right there was considerable dulness on percussion over the whole anterior surface; but particularly great between the sternum and mamma downwards, the heart occupying this position. The respiration, except in this part, being very clear and puerile. It being considered that paracentesis, cautiously performed, held out the only prospect of recovery, Mr. Syme, on the 31st of October, drew off 21℥ of greenish coloured pus, on the 7th of November, 50℥, of a similar fluid were removed, and on the 14th, 34℥, the chest being now apparently emptied. The instrument employed was a trocar about the eighteenth of an inch in diameter, and about two and three quarter inches in length. The parts selected for puncture were different points between three or four inches external to the nipple, in the sixth intercostal space. No general treatment was pursued, except restricted diet, and an occasional purge, with the compound powder of jalap. A large blister, however, was applied on the side, and gr. ij. of the iodide of potass given twice a day. On the 9th of April, he was again tapped, and 40℥ taken away; and on the 15th, 26℥ were again removed. The situation formerly punctured was made choice of, and after each operation great relief was obtained. The patient now appeared at different times to have the operation of paracentesis performed. On the 8th of July, 79℥ of pus were removed: on the 30th of September, 112℥; on the 1st of February, 1848, 72℥ were withdrawn:- and from this period up to the 4th of January, the operation was performed four different times, draining off on the 18th of May, 1848, 57℥; on the 19th of August, 1848, 37℥; on the 27th of February, 1849, 67℥, and the 4th of January, 1850, 26℥.]

Thus he was operated on twelve different times, and in all 621℥ of pus—equal to about four gallons—were taken from him. On each successive admission there was a manifest improvement of his general health and strength; he could undergo a very considerable amount of fatigue, and on the six last occasions he returned home on the day following the tapping, without the slightest inconvenience or injury. The changes, too, in the configuration of the chest, more especially in the disappearance of the infra-clavicular fulness, were very marked; and when last seen, the intercostal spaces had much the same aspect as those of the opposite side; and there was now some degree of movement of the side, during respiratory efforts, very different from its previously paralysed condition. More healthy respiration, also, was heard anteriorly, as low as the edge of the pectoral muscle, and also along the back near the spine. The heart now lay close to the sternum on the right side, and its impulse and sounds were perfectly normal. In the three last tappings I found that considerable force was necessary to introduce the trocar, owing, apparently, to the thickness and hardness of the pleura. This was particularly the case in the last operation; and, although the canula of the trocar measured two and a-half inches in length, it seemed short enough for the depth of parts to penetrate. I may remark, also, that the fluid drawn off, although secreted in greatly increased quantity from November, 1846, to September, 1847—at which time it was going on at the rate of 56℥ per month, from that period until the 4th of January last, it came gradually down in quantity, until it had arrived at a ratio of little more than 2℥ per month. It is interesting, also, to remark, that while the fluid was sero-purulent at first, and afterwards became pure pus, that at the last tapping a considerable amount of serum separated from the pus. This change, viewed in relation to the progressive improvement of Neilson's health in all respects, made me feel confident that a cure would soon be complete; and, accordingly, I am glad to report that, in a statement which I had from him a few days since, he says that he considers himself quite recovered from the affection; that he has felt so strong and well since he was last under treatment, that he recently entered into the bands of wedlock; and is convinced that no farther operative interference will be necessary. He states that he is now capable for any ordinary exertion, can lie on either side without oppression of breathing; and does not consider that there is any material change in the configuration of the chest—unless it be a slight depression of the shoulder, and tendency to stoop, which, however, he states was the case before the inflammation occurred.

Of course, when a cure in this case is said to be complete, I admit that there is a lung, of which, perhaps, less than one-third only is fitted to perform any part in the function of respiration; that there is an enormously thickened pleura, with strong adhesions connected therewith; and that there is a dislocation of the heart from its own compartment of the thorax, to which it can never return. Notwithstanding all this, I regard Neilson's case as satisfactorily cured, seeing that the functions of respiration and circulation are now carried on compatibly with existence; that the strength is re-established, and fully adequate for the duties of his calling; and that, instead of feeling life as a burden, he is now in a condition, and is seeking to enjoy it.

The most promising feature in the case was its being a simple pleural accumulation, uncomplicated with other thoracic disease; and there can be no question, but that had an operation been earlier performed, the affection would have been brought sooner to a satisfactory termination. Respecting those cases of hydrothorax, inflammatory or mechanical, which may, or may not, at an early period, be treated by paracentesis, it is not at present necessary to give an opinion; but it appears plain that, as a general rule, whenever pus is detected in the pleural sac, it ought to be evacuated in this way; and that the operation be repeated from time to time, as the breathing begins to be embarrassed in consequence of a fresh accumulation. Should there be a decided prominence or protrusion at any one point of an intercostal space, and more especially if attended with pain or tenderness and discoloration, indicating that the matter is seeking an outlet for itself, the best practice is to allow it to point well, allowing nature to perform her own work, unless the symptoms of dyspnœa, &c., are urgent, when an artificial opening must be immediately made. Even in such circumstances, however, it is advisable to draw off the fluid by tapping in the first instance, rather than by incision, as it is impossible to predict what the diseased membrane will bear in the way of a wound inflicted on its surface. In cases complicated with pneumothorax the case is different, for much greater freedom may be used; although it is perhaps most judicious to make the incision small at first, and dilate more freely a few days afterwards. I have in this manner treated successfully several interesting cases of this serious affection, in which there was reason to believe that the fistulous communication with the lung had been formed by an empyema bursting through its substance. In Neilson's case it was considered proper at first to withdraw only a portion of the fluid at a time; but it was soon apparent that the whole might, with safety, be evacuated at once; and this practice I should not hesitate to adopt in any future case, with the precautions to be afterwards noticed. In reflecting on the history of the case, the impunity with which the various operations—twelve in all—were practised, and the manifest relief derived from each, it is impossible to avoid the conviction of the unlikelihood, or rather the utter hopelessness, of expecting that a cure could have been accomplished by the long continued use of blistering, iodine, and mercury, which would have been trusted to by some practitioners. The main objection to paracentesis thoracis has been the apprehension of air finding an entrance to the pleural sac, and thus exciting violent inflammatory action. To avoid this supposed danger in Neilson's case, all due precautions were taken. These consisted, as I have already noticed, in the employment of a very small sized trocar and canula, so as to make it impossible that any large rush of air inwards could take place, and to insure more certainly the immediate closure of the wound; in prohibiting conversation during the flow of the fluid, so as to maintain equal and easy inspirations, and prevent any suction power being exercised from within; in the change of position during the operation,—turning the body over, cask-like, when the stream was becoming feeble; and in withdrawing the canula the instant the stream became interrupted. I agree with Drs. Townsend and Roe in thinking that this source of danger from paracentesis,—the admission of air during the operation,—has been much exaggerated, which is proved by abundance of surgical experience, both in operations with the trocar, when air was known to have entered freely and with the lancet and bistoury in cases of pneumothorax, when its exclusion was not sought. The experiments of Nysten and Speiss also sufficiently prove that air introduced into the pleura is invariably removed by absorption in the course of a few days. Dr. Roe, however, says, "It is clear that if we evacuate more fluid than can be replaced by the expanding lung, air *must* fill the vacuum; but as this does not seem to be attended with either danger or inconvenience, I think it better to evacuate the whole of the fluid at once with the trocar." Now, admitting the truth of the well-known saying, that "nature abhors a vacuum," he keeps out of view altogether the extent to which the collapse of the thoracic parietes on all sides by atmospheric pressure will, in such circumstances, assist in diminishing any space which the partial replacement of its contents, besides the expansion of the compressed lung—small though it may be—and the ascent of the diaphragm, cannot accomplish. All this is the more likely to occur, provided paracentesis is performed with the precautions already recommended.

Some surgeons have treated cases of empyema by leaving the canula or a catheter in the wound. Dr. Roe objects to this fatal practice, "because it allows a *continual* ingress and egress of air" to the pleural sac, and thereby excites inflammatory action. Now, although this source of danger must be very great in any case, uncomplicated with pneumothorax—or in which nature has not herself prepared for a fistulous opening the main danger would arise from the direct and continued irritation of the instrument left in the wound, acting as a foreign body by pressure on a membrane predisposed to diseased action. It is strange that this latter explanation, rather than the former, did not occur to Dr. Stroud, when remarking on a case published, by him in which a fatal result followed the use of an elastic gum catheter after paracentesis.

It is from the infliction of a similar injury that bad consequences generally follow the old method of performing paracentesis. It consists in making an incision in the intercostal space, drawing aside the skin, and then penetrating the pleura with a common hydrocele trocar. It is a clumsy expedient, possessing an appearance of scientific ingenuity, with the view of valving the internal part of the opening, and obtaining a better closure of the wound. Unfortunately, however, it often happens that the wound either does not heal by the first intention, or soon breaks open again; and when that occurs in a bad subject, or where there was no preparation made, as I have already remarked, for a fistulous opening, mischief is almost inevitable. The danger, however, is not from air admitted during the operation. but partly from its admission subsequently and constantly, and more especially from the violence done to the pleura by the operative procedure itself. This method contrasts ill with the simple and safe practice adopted in Neilson's case, in which, although twelve times tapped, on all these occasions there was an immediate closure of the trifling wound, and in none the slightest approach to inflammatory action.

A remarkable feature in Neilson's case was the extent to which the heart was displaced for its apex was found to beat fully an inch external and inferior to the right nipple. That this should not have occasioned a greater change in its action and sounds is unexpected, although quite in accordance with the observations of Laennec and others in cases of less extreme dislocation.

This case also points out in a very clear light the sure marks which characterise a pleural accumulation, and distinguish it from other diseased pectoral states. The displacement of the heart alone, viewed in connection with the general symptoms, was quite sufficient to prove the existence of a large effusion in the left sac; but the nature of the case was made still more evident by the general enlargement of the chest on this side discoverable by the eye; the fulness of the infraclavicular region; the disappearance of the intercostal spaces generally; and their rounded, although not prominent aspect at the lower and lateral part of the the chest. Then there were the very significant signs of immobility during respiration, and the total absence of vocal vibration. No disease could present more precise indications than the above; and although the remaining physical signs furnished by percussion and auscultation were the least important, as they always are in this affection, they lent their evidence to confirm satisfactorily the diagnosis.—*Monthly Journal of Med. Science, Aug.* 1850, *p.* 138.

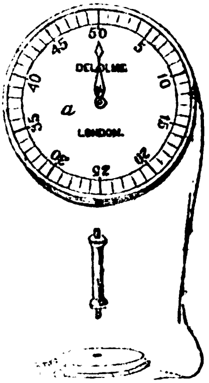
42.—THE STETHOMETER.

AN INSTRUMENT FOR FACILITATING DIAGNOSIS, BY MEASURING THE DIFFERENCE IN THE MOBILITY OF OPPOSITE SIDES OF THE CHEST.

By Dr. R. Quain.

[In many cases, the modifications produced in the movements of the chest, by disease, are so great as to be at once evident to the eye, or to the eye assisted by the hand; but in the more numerous cases, the eye and hand cannot detect these alterations. As nothing is more common than to find a difference of opinion with regard to the greater or less mobility of a portion of one or other sides of the chest, it is desirable that the mode of investigation should be exact for observation, and definite for description. Although for a long time Dr. Quain was unsuccessful in contriving such an instrument, yet subsequent observations led him to believe that an instrument, simple, portable, and economical, capable of ready application, and of affording very valuable information, might be constructed, different from that of Dr. Sibson, and differing in principle from all others. Dr. Quain says:]

I explained my requirements to Mr. Delolme, chronometer maker, whose ingenuity has supplied many ingenious and beautiful contrivances of an analogous kind. The result has been the little instrument which I am now going to describe, and which has, in the hands of those who have used it, as well as in my own, been found very efficient for the intended object; viz., to measure the comparative mobility of opposite sides of the chest. It is susceptible of many other applications, to some of which I shall again refer, and which will, no doubt, suggest themselves to those into whose hands it may fall.



Description.—The little instrument (see fig.*) consists of a flat case, not unlike a watch-case; on its upper surface is a graduated dial and index, which stands at a maximum number, that may be considered a "zero." This case contains a very simple movement, by means of which the index can be acted on. A silk cord, which may be of a sufficient length to surround one-half, or the whole circumference of the chest, passes through an aperture in one side of the case. This cord acts on the index. When the cord is drawn out, or extended to one quarter of an inch, it will be observed that the point of the index will once traverse the circumference of the graduated dial. In other words, when the index has gone once round, it shows that the cord has been extended one-fourth of an inch. It will be further seen, that the dial is graduated, or divided, into fifty equal parts. Each of these parts is therefore, equal to the fiftieth part of a quarter of an inch; that is, to the 1-200th of an inch.† The index is further capable of going round a second time, on an additional quarter inch of the cord being drawn out. Hence two revolutions of the index are equal to half an inch of movement—an extent of motion sufficient for all practical purposes. The pedestal and circular foot, shown in the same figure, will be subsequently referred to.

Mode of application.—It is quite evident, that if the instrument be so placed that extension be made on the cord, the amount of the extension will be shown by the movement of the index on the dial. For example, if the instrument is laid flat on the spine, and held in its place by the first and second fingers of the left hand, whilst the cord is carried round the chest, and pressed on one of the ribs or the sternum, by the fingers of the right hand, then, when the individual under examination expands the chest during inspiration, the amount of expansion will be communicated to the cord, and thus indicated on the dial. The cord may then be directed around the opposite side of the chest, and thus will be at once seen any difference which exists in the relative mobility of the two at the point under examination.

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* The instrument is reduced in this sketch to half size.

† In making and recording observations with this instrument, I am in the habit of expressing a fact thus: right apex, 30; left, 15. It will be understood that the motion is as 15 to 30, without reference to these figures being eighths, fifteenths, or two hundredths.

It will, of course, be absolutely necessary in every examination, such as this, that corresponding parts of the chest be compared. For all useful purposes it may be said, that the movements of the opposite sides of the chest, in health, are identical—the difference which exists over the region of the heart, at the left side is too immaterial to interfere with practical conclusions. The instrument may be applied to any part of the chest in the mode here described.

[Dr. Quain here introduces a wood-cut representing the position of the instrument when applied on the sternum, and also when applied beneath one of the clavicles. He remarks :]

The latter position is one of considerable importance, from its connexion with the deposition of tubercle towards the summit of the lung. I find that on applying the instrument here the cord may, in this instance, be directed towards the arm more conveniently than in any other direction, and pressed against a point near the insertion of the deltoid muscle. The cord may also be directed downwards, or outwards, and upwards, or inwards, and retained on any fixed point. Nor, as is evident, need this point be a part of the body. It may be on a bed, or on a chair, &c., always providing that the direction of the cord be such as to receive the impression of the movement of the part of the body under examination, and that its position be symmetrical at both sides.

It may be used with the pedestal, which can be fixed in the side of the case with the foot attached as shown in the figure. The instrument thus used is intended to ascertain the modifications of the movements over a limited or circumscribed spot. On this spot the foot is placed and held by the fingers of the left hand, the cord directed towards this point is held between the fingers of the right hand. These fingers, being thus made the fixed point, must be kept steady and not allowed to touch the part under examination. The spring in the instrument is sufficiently strong to resist the gentle tension made by the fingers, and the instrument itself being pushed forward or raised by the elevation of the part during inspiration, the movement of the index, as when the case is applied on the flat surface, becomes the measure of this elevation.

Such being the mode of using the instrument, it will be necessary to say a few words on the precautions which are required in securing accuracy in the result. 1st, It is absolutely imperative that corresponding portions of the chest be examined, and that the mode of applying the instrument, and the point at which it is applied at each side, be identical. 2d, Care must be taken that the patient breathes in the same manner whilst opposite sides are being examined. 3d, It should be seen that the cord, when the observation is commenced, is held sufficiently tense to act on the index.

All this requires attention and some little effort: for, as in all other matters, there is little that is of any value which can be obtained without some labour. Though to some few patients these carefully conducted examinations may be irksome, yet to the vast majority they are far otherwise. In the latter, they beget confidence in the medical attendant, and frequently at once inspire a feeling which renders all future intercourse not less pleasing than it is conducive to successful treatment.

Uses of the Instrument.—The expansive movements of the chest during inspiration may be said to be the measure of the capacity of the lungs for air. So they are; and by an accurate measurement of the one, we might estimate tolerably correctly the other, and thus be able to compare the relative breathing powers of different individuals. It is exceedingly difficult to make this comparison by external measurement; for the movements of analogous or corresponding parts of the chest, even in those with unimpaired respiratory powers, are remarkably different in different individuals. For not only are such movements modified by age, sex, and occupation, but they are influenced by peculiarities beyond the influences apparently of any fixed or recognized rule. I therefore do not propose to use this instrument in testing whether A has a better breathing power than B. The spirometer of Dr. Hutchinson is a far more correct means of estimating this quality. I propose my instrument as a means of ascertaining any want of symmetry, independently of malformation, and therefore indicative of disease, in the movements of the corresponding parts of the same chest.

It is not my intention to discuss here the various conditions under which this want of symmetry may occur. Obstruction, for example, of a bronchus by a foreign body in, or by a tumour pressing on it, will interfere with the movements of the side of the chest containing the lung to which such bronchus is distributed. Disease of the substance of the lung, tuberculous, malignant, or inflammatory, and emphysema affecting the air-cells, also prevent the free expansion of the lungs or parts of them affected. Diseases of the pleura, viz., acute or chronic pleurisy; bands binding down the lung; pleuritic effusions or tumours in the pleura, have a like effect. Pleurodynia, and diseases of the external walls of the chest, may, of course, interfere with their free movements. However trifling the degree of limitation of motion, which may be produced by any of these diseases, or by many others not here enumerated, I believe this instrument, if properly used, will inevitably indicate it. When such limitation is thus observed, recourse must be had to the study of the general symptoms, and to the other means of physical diagnosis, to discover on what the irregularity depends. Thus, then, attention may be, in the first instance, directed by the use of the instrument to the seat of disease; or, when disease has been suspected or discovered by other means, mensuration will be useful in confirming the diagnosis, and expressing the extent of the local lesion. In both these senses, I have found the instrument an exceedingly valuable aid in the diagnosis of the early stages of phthisis. Indeed, it is quite remarkable how early, and to what an extent, the respiratory movements are modified by tubercular deposit. I hope, however, on some future occasion to return at some length to this and some allied subjects connected with the disease. It will, of course, be evident that if both sides of the chest are equally diseased, we lose the means of comparing them; but such an event is one of very rare occurrence. The instrument can also be used in investigating the movements of the diaphragmatic or abdominal respiration, and in taking notice of any irregularity which may be produced in it by disease of any of the organs placed beneath the diaphragm.—*London Journal of Medicine, Oct.*, 1850, *p.* 924.

DISEASES OF THE ORGANS OF DIGESTION.

43.—ASCITES.

By Dr. Todd, F. R. S., &c.

[In a clinical lecture on cases of ascites, at King's College Hospital, Dr. Todd points out that peritoneal dropsy, or ascites, "has its origin in the portal circulation, although not always in the same parts of that circulation." It may also be associated with other forms of dropsy, as when the heart acts imperfectly; or when the kidney is diseased; or when, from the effusion, pressure is made on the ascending cava, thus impeding the return of blood from the lower extremities.]

Of the causes of ascites, by far the most frequent is disease of Glisson's capsule, or of the liver itself. 2ndly. Disease of the peritoneum is not an unfrequent cause, either of chronic peritonitis, or tubercular or cancerous disease of the peritoneum; but these seldom cause extreme distension of the abdomen, unless the morbid mass presses very much on the portal vein or some of its principal tributaries. 3rdly. Tubercular disease of the mesenteric glands, when the disease causes such enlargement of them as to form a tumour, which compresses the mesenteric veins. 4th. Enlargement of the spleen, too, is apt to produce ascites, but seldom, I think, to a great extent, as the spleen has an extraordinary power of adapting itself to changes in its circulation; and likewise because its position does not enable it when enlarged to exercise great pressure on the other tributary veins of the porta. 5th. I have seen, also, a case in which enlarged kidney gave rise to ascites. 6th. Acute peritonitis will produce ascites; this is of a different nature from those previously mentioned, and falls more under the category of acute dropsy. The peritonitis, gives rise to an undue accumulation of blood in the capillaries beneath the peritoneum, and the dropsy takes place as a consequence of this congestion or sub-inflammatory condition.

I will now call your attention to one or two conditions which may possibly be mistaken, and, indeed, have been mistaken, for ascites, the necessity of guarding against which fallacy renders the diagnosis rather more complicated.

Sometimes we find in ovarian dropsy that there is a clear tympanitic sound over the tumour; this may be caused by the development of gas in the cyst, either through a process of decomposition of its fluid contents, or by a kind of secretion, as when the bowels generate gas, but more commonly, I think, when a communication is formed between the tumour and the bowel, and the flatus from the latter gets into the ovarian cyst. A short time ago there was an interesting example of this in the hospital. A woman having all the signs of ovarian dropsy was tapped three or four times: there was dulness all over the tumour, and there could be no doubt about the case; when suddenly the tumour became perfectly tympanitic, and, on opening the body after death, a communication was found between the ovarian cyst and the intestine, through which the flatus had escaped into it, and given rise to conditions which made the case exactly resemble ascites. If the entrance of flatus had occurred earlier in the case, the diagnosis would have been extremely difficult.

Ascites, with very tympanitic bowels, would present exactly similar signs to those present in this case.

There is another source of fallacy which may be mentioned, as it was one into which John Hunter fell. Sir Everard Home mentions that that great surgeon and physiologist once tapped a *distended bladder*, under the idea that it was a distended peritoneum. We know that patients are very apt to allow their urine to accumulate, especially when they are unable either to feel acutely, or to communicate their wants, as is often the case in fever. The only symptom of the commencement of this distension may be that the patient passes a restless night: the medical attendant, perhaps, does not look for the real cause, and by and by the bladder becomes so distended as to fill the whole abdomen. Now you can easily understand how it would be very difficult to distinguish such a state from ascites. You should always ascertain how the urine is passed; and if this is such as to leave any doubt, you should pass the catheter.

There is only one other thing that occurs to me as possibly mistakeable for ascites, and that is an enormously distended stomach. To what an extent this distension may take place we had an opportunity of seeing not long ago, in a woman who died of chronic gastric disease. The stomach was so much enlarged, that it filled the whole anterior part of the abdomen, all the other hollow viscera being compressed behind and below it. Such a stomach, filled with fluid, may produce fluctuations very analogous to those of ascites. The way to put the matter beyond doubt is to produce vomiting, and cause the ejection of all the contents of the stomach: if, then, the undulating fluid was in the stomach, the fluctuation will immediately disappear. I had an interesting case of this a little time ago in my private practice; and I ascertained the nature of the fluctuation by visiting my patient the next morning before he had taken anything, when the fluctuation had entirely vanished.

Treatment.—You may gather from the details already given in the history of the cases, much respecting the proper course to be pursued. If you can clearly make out that the ascites depends on disease of the liver and of its capsule, and if the liver be not permanently contracted, then the treatment should be directed to the reduction of the chronic inflammation which affects the capsule. With this view the use of mercury should be resorted to, and in many instances it will prove highly useful, and a free discharge of water by the kidneys will often take place simultaneously with the production of ptyalism.

It is also, of course, desirable to increase the action of the kidneys by other means besides. In the cases which I have detailed to you, we used as diuretics, with variable degrees of success, broom, taraxacum, cantharides, nitre, bitartrate of potass, lemon-juice, digitalis, squills; and these are among the best of a very uncertain class of remedies.

I also recommend your attention to the part of the treatment I have made use of with great advantage, viz., *pressure* on the abdomen by means of bandages and strapping. Two of the cases derived great benefit from it, especially the man; he expressed himself (and the feelings of the patient are in such a case very valuable) as much relieved.

A question often arises as to the propriety of *tapping* in ascites. The opinion that I have come to is, that the operation of tapping should be postponed as long as possible; but that that should not be until the distension is extreme. When the distension is allowed to become excessive, the danger from tapping is greatly increased; therefore, if you have tried all reasonable measures and they have failed, do not wait for extreme distension, but tap at once. The danger to be apprehended from the operation is the supervention of peritonitis, and the sinking of the patient. Now the danger of peritonitis may be very much guarded against, by keeping your patient for some time pvevious to, and during the operation, under the influence of opium.

Still, tapping can be regarded generally only as a palliative measure, and affords very little hope of ultimate cure: nevertheless, it is not, however, perfectly hopeless, for I can tell you of two cases of recovery in my own experience. One of the cases you may have often seen; the woman frequently comes to the hospital for other complaints. She was tapped twice, and I followed the practice I have recommended to you; but with no success. I then tapped her a third time, after which she quickly recovered, and has remained well now for five years. The other case was a man who was tapped for ascites apparently dependent on hepatic disease; he got quite well, and several years afterwards came into the hospital for another disease.

Both of these cases exhibited, to a remarkable extent, a sign to which I have already alluded as not unfrequently present in peritoneal dropsy—namely, a dilated and tortuous condition of the epigastric veins. This venous enlargement is probably compensatory, and serves to open up a new and enlarged channel for the blood which cannot be returned through the hepatic circulation. Hence I am disposed to regard great enlargement of these veins as a favourable sign; and I should be more inclined to tap where that enlargement exists than where the veins remained small.

Tapping may be performed with more hope of success when the liver is enlarged than when it is contracted; and when it affords least prospect of benefit when the obstructing cause to the venous circulation is extrinsic to the liver, as when it consists of a tumour, or of chronic peritoneal disease. Upon the whole I come to this conclusion—that tapping, though a remedy not lightly to be adopted, is not one lightly to be rejected; and though in the majority of cases it does not result in an ultimate cure, yet it is not perfectly hopeless.—*Med. Gazette, Oct.* 11, 1850, *p.* 640.

44.—TREATMENT OF ASCITES BY DIURETICS APPLIED EXTERNALLY.

By Dr. Robert Christison, V. P. R. S. E., &c.

[Having read a paper in a French periodical, where digitalis and squill applied in the form of a liniment, had been successful in removing the fluid in ascites, after all other means had failed, and having under his care a boy who had simple but gradually increasing ascites,—but in which the usual means adopted failed in affording relief—Dr. Christison resolved to try the French method of treatment. He says:]

When he came under my care, purgatives and diuretics internally were again tried, and especially digitalis and squill, but with no better success than before. On the contrary, the enlargement and tension of the belly became gradually very great, so that the boy was confined in a great measure to bed. The French suggestion came therefore most opportunely. A mixture of equal parts of tincture of digitalis, tincture of squill, and tincture of soap, was rubbed freely and diligently into the skin of the belly morning and evening. At an early period,—so early, if I do not mistake, as the beginning of the third day,—the urine began for the first time to increase; by and by a copious flow was established; the ascites quickly subsided, and in about fourteen days entirely disappeared; the boy at the same time gained flesh and strength under the use of simple bitters and chalybeates, and ere long his health was completely restored. When I last saw him, four or five years afterwards, he continued well and strong.

The same treatment was tried afterwards in several cases more or less similar to this, but for a time with invariable disappointment. In all, however, the more ordinary measures had previously been exhausted to no purpose; and in most of them decided organic disease of some abdominal organ was ascertained to be the cause of the effusion. At length the following remarkable case revived the hopes excited by the first experiment. A boy, about nine years of age, had been affected with enlargement of the liver and ascites for nearly a twelvemonth. Dr. James Duncan, his medical attendant, had applied all the most serviceable remedies, but to very little purpose. Mercury, iodine, purgatives, diuretics, both vegetable and mineral, had been faithfully given, occasionally with partial effect, but not with any satisfactory amendment. At length the ascitical distension became enormous, the integuments acquired a glistening translucent appearance, the respiration was impeded, and the tightness of the skin prevented the nature and extent of the disease of the liver from being ascertained. But there was no œdema, even in the limbs. In this state I saw him for the first time. Before resorting to the temporary expedient of tapping, it was proposed to make trial of the diuretic liniment; but the integuments were so irritable, that the method by friction could not be persevered with. Dr. Duncan, however, proposed to substitute a strong infusion of digitalis, four times the pharmaceutic strength, and to apply it continuously by linen cloths covered with oil-silk to impede evaporation. In a few days diuresis set in, and a profuse flow of urine quickly removed the whole dropsical effusion. The liver was soon felt to be greatly enlarged, lobulated, and rugose; which disease, it need scarcely be added, proved fatal a few months afterwards. But it is remarkable that the ascites never returned.

I have often used the same method since, both in simple ascites, and likewise where that affection formed a prominent part of a more general dropsy. The issue has of course been variable, and more frequently unfavourable than successful. But on the whole the results of my own observation, and the experience of others in Edinburgh, who have also tried the practice, lead to the conclusion, that digitalis not unfrequently succeeds in this way, when not only it, but likewise all other diuretics, taken internally, as well as the purgative method of cure, prove of no avail. It has likewise been tried with success in a few cases of obstinate excessive œdema of the limbs, in connexion with general anasarca and Bright's disease of the kidneys, after diaphoretics, purgatives, and diuretics internally, had failed to give relief.

The late invention of the texture called Spongio-piline has facilitated the application of this treatment. A large sheet of spongio-piline soaked moderately with a strong infusion of digitalis, made with one ounce of powdered leaves to twenty fluid ounces of boiling water, may be applied to the whole abdomen, or to each limb, and worn constantly without any material inconvenience to the patient. I lately met with a case of Bright's disease, in the University wards of the Royal Infirmary, in which considerable general anasarca, developed to a great extent in the limbs, and concurring, as sometimes happens, with a natural diuresis, was for a time reduced almost entirely by the soaked spongio-piline applied to both legs, although every other customary remedy had been administered unsuccessfully. In another case, that of a dissipated middle-aged woman, who presented all the characters of the variety of Bright's disease which is supposed to depend on chronic inflammation of the kidneys, diuretics given internally removed almost entirely the general anasarca, after diaphoretics had completely failed; the patient thereupon was speedily relieved also of an obstinate chronic bronchitis, liability to vomiting, and tendency to diarrhœa. But the ascitical effusion, which had been predominant from the first, was not reduced at the same time. On the contrary it went on increasing till the integuments became tense. The foxglove infusion was then applied by means of the spongio-piline, with the effect of augmenting the flow of urine in a few days; and then the ascites decreased, at first quickly, afterwards more slowly, till at length all dropsical effusion had disappeared, so that the woman, after seven months of treatment, left the hospital in a fair state of health to outward appearance, and with the urine much less albuminous, and much less loaded with the debris of tube-casts and epithelial cells.

I have tried to ascertain the description of cases in which this treatment is most likely to prove successful, but without any satisfactory result. The pathology of ascites indeed is still not sufficiently understood to allow of an accurate inquiry as to the influence of remedies. Simple ascites, or that along with œdema of the legs and lower half only of the trunk, is known to be a symptom, or rather a sequela, of various organic diseases, such as existing or previous chronic peritonitis, cirrhosis and other organic derangements of the liver, enlargement of the spleen, diseased pancreas, enlarged mesenteric glands, malignant disease of the abdominal lymphatic glands, near the great abdominal vessels, or of any other organ or texture so situated that the tumour thus arising exerts pressure on the great veins. But the physician cannot always distinguish during life, among all these causes, what is the real source of the dropsical effusion; and, on the other hand, several at least of these organic diseases are known to occur not unfrequently without being attended with ascites at all. In these circumstances it is not surprising, that a difficulty is encountered in ascertaining the description of cases in which the ascites is most likely to yield to a particular mode of treatment.

An analogous method, by means of a poultice made with the *Marchantia Hemispherica*, or common liverwort, was recommended in 1833 by the late Dr. Thomas Shortt of this city, for the treatment of dropsies in general. I have not found this remedy so generally serviceable as Dr. Shortt seems to have expected, and his method of applying it is irksome to the patient.—*Monthly Journal of Med. Science, October*, 1850, *p.* 310.

45.—CASES TREATED BY KOUSSO IN KING'S COLLEGE HOSPITAL.

By Dr. Budd. (Reported by Mr. Robert C. R. Jordan.)

[Dr. Budd states that the Kousso otherwise called Brayera Anthelmintica, from Dr. Brayer, is a tree growing to the size of the oak, classed among the *Rosaceæ*. The flowers which are medicinal, are used by the natives of Abyssinia as a remedy for tape-worm. Kousso is a brownish powder, (as we see it), very like jalap, and smelling like scammony, with a slightly bitter and somewhat nauseous taste. The price is enormous, 35s. being charged at present for a dose of 4½ drachms. Dr. Budd says:]

Nine doses of the medicine have been given by us, and not one of these has failed to kill and expel the worm. The medicine has been given in the morning, before breakfast, which is the best time for administering all remedies for tape-worm, as the small intestine which the worm inhabits is then more empty than at other times; the worm, consequently, less likely to be sheathed, and protected from the action of the drug, by the other contents of the bowel. The powder has been infused for ten minutes in three-fourths of a pint of hot water. The infusion has then been stirred, and the whole drunk.

One of the patients, under the care of Dr. Todd, a woman advanced in pregnancy, vomited about half of the dose; but what remained in the stomach destroyed the worm. Two of the other patients had a slight feeling of nausea for ten minutes or a quarter of an hour, after taking the medicine. Another was several times purged by it; another, the woman to whom we first gave it, had headache after taking it, and ascribed to it a diuretic effect. The rest felt no uneasy sensation whatever from the medicine.

In the cases that fell under my own care, I ordered the patients to live sparingly, and to take a seidlitz powder, or a dose of castor oil, the day before taking the kossou, for the sake of emptying the bowels, and so leaving the worm more exposed. This is a precaution which it is well to take before administering any of the remedies for tape-worm. They all act directly on the worm, and to take effect must, of course, be brought in contact with it.

I also ordered the patients to take a seidlitz powder, or a dose of castor oil, after the kousso, to carry the medicine down to the worm and to expel the dead or enfeebled worm from the bowels. This expedient, also, is equally applicable to other remedies for tape-worm, and especially to turpentine, which, if it remains long in the stomach, or passes slowly through the bowels, gets absorbed, and irritates the kidneys and bladder, producing strangury and bloody urine, and may not reach the worm in quantity sufficient to kill it.

Tape-worms are very tenacious of life. They are seldom voided entire without the aid of medicines that act especially upon them. Single joints often come away, and pieces two or three feet long are now and then voided, but it very seldom happens, unless after medicine, that a portion comprising the head is thus passed. This portion remains and grows again, so that a person is often plagued with the parasite for years. One of our patients, Sarah Wheeler, had been so plagued for sixteen years, during which she told us that she had seldom gone a week without passing joints of the worm. She had taken turpentine, and the bark of the pomegranate root,, and some years ago, when she was at Fort Beaufort, at the Cape of Good Hope, she took the root of a plant used by the natives as a remedy for tape-worm, which she says is called there "Cacay." She describes this root as being round, and when scraped, white, like a turnip, and sweet to the taste. This medicine had very little effect. The turpentine and the pomegranate brought away long pieces of the worm, but the head and the portion near it remained, and the worm grew again. The worm was expelled after the kousso in different portions, on the 11th and 12th of April, and she has since had none of the symptoms which she attributed to it. She is still (May 31st) in the hospital, for prolapsus of the uterus, which she has long had but she feels convinced that the worm is entirely destroyed.

Another case, that shows more strikingly still the tenacity of life of the tape-worm, is that of Samuel Payne. He first passed joints of the worm seven years ago. In September last, he was brought into the hospital with cholera, and on the day of his admission passed a portion of the worm two yards in length. He remained in the hospital three weeks, on account of the cholera. Some time after this he again passed joints of the worm, and to get rid of it came to the hospital as an out-patient. Turpentine and castor oil were given him, and brought away a long piece of the worm. The ailments which he attributed to the worm were much relieved for a time. They then became again more severe; joints of the worm were again passed, and in January last he came for the second time to the hospital to be ridded of the worm. Turpentine and castor oil were given him, as before; a long piece of the worm was again expelled, but the creature was not destroyed; so that here the worm had existed seven years, had kept its place during the terrible commotion and flooding of the intestine in cholera, and had escaped destruction by two doses of turpentine. Payne took the kousso on the 3rd of May, and the next morning voided the worm, which was ten yards long.

In all the cases in which the kousso has been given in the hospital, the head of the worm or the taper portion near the head, has been found, so that there is reason to suppose that the creature has been entirely destroyed. The action of the medicine is very speedy. In one of the cases, in which the bowels were slow to move, the worm was expelled, in different portions, in the two days succeeding that in which the kousso was taken; in all the other cases, it was expelled the same day, and in several of them after the lapse of only three or four hours.

The result of our experience, then, is, that the kousso is a very effectual remedy for tape-worm: and that in its action it is both speedy and safe.

I have had little experience of the male fern. But the kousso is certainly much more efficacious than the pomegranate; and much more efficacious, as well as less disagreeable, and safer than turpentine. There is a considerable demand for it at the hospital, which, on account of the cost, we cannot satisfy. I trust, however, now, that its efficacy is known in this country, which has commercial relations with every part of the world, that a fresh supply will soon be brought here, and that we shall have it at a reasonable rate.

Persons who have tape-worm generally discover the fact by the passing of joints. The worm seems to grow rapidly; and the tail joints, as they attain their full development, drop off, and are voided with the other contents of the bowels. Probably no person suffers very long from tape-worm, without voiding some of these joints. The existence of the worm cannot be safely inferred, and the remedies for it cannot be given with a fair chance of success, unless joints have been passed. It is a common belief that while joints are dropping the worm is feeble, and that the medicines which kill it act more surely soon after joints have been passed.—*Lancet, June* 29, 1850, *p.* 773.

46.—THE KOUSSO—BANKSIA ABYSSINICA.

By JAMES VAUGHAN, Esq., Assistant Surgeon Bombay Army, Port and Civil Surgeon, Aden, Arabia Felix.

[After noticing the interesting report of the cases treated by kousso by Dr. Budd, Mr. Vaughan says]

In the report above alluded to, I observe that the "kousso" is called the "Brayera Anthelmintica," from Dr. Brayer, who first introduced the use of the plant, or rather made its virtue known in Europe. On referring to Bruce's Travels, Vol. vii., Appendix, a minute and accurate description of the medicine is found, as also an engraving of the plant in the volume of plates. That great and much calumniated-traveller, calls it, in testimony of esteem for a friend, "Banksia Abyssinica; and I submit, with all deference, that as James Bruce was the first traveller who brought the plant into notice, the name given by him ought to be retained.

In the appendix to the second volume of the 'Highlands of Ethiopia, by the late lamented traveller, Sir W. C. Harris, the following mention is made of the ("Cossoo,") by Dr. Kirk, who was a member of the embassy:

"Hagenia Abyssinica, ('Cossoo') affords, in a cold infusion of the dried flowers and capsules, the famous drasticum purgans and anthelminticum of the Abyssinians. The tree is one of the most picturesque in appearance."

In Southern Arabia, on the sea coast, and along the shores of the Red Sea, it is well known, and considered a most valuable medicine. In the Northern and Southern Abyssinia it is universally used about once a month, the trees being numerous, and the medicine costing hardly anything. At Hurrur, a province bordering on the kingdom of Shoa, it is well known, and used; though the Somali tribes, residing to the eastward, on the N. E. horn of Africa, are unacquainted with its virtues. Bruce mentions that no Abyssinian will travel without it; and I am informed by my friend Lieutenant Cruttenden. Assistant Political Agent at Aden, that such is actually the case, to his knowledge: the few Abyssinians who visit the port of Aden, invariably bring with them a supply. The dose I understand to be a small handful of the flowers mixed with water, in which sometimes tamarinds are infused, the patient while under its effects, keeping far aloof from every one. Its operation is speedy and most effectual.

In a country like Abyssinia, where almost all, if not the entire population, are more or less affected with tape-worm, the "kousso" is a special blessing of providence, as a medicine within the reach of the poorest shepherd, and infallible in its effects.

Mr. Coffin, an Englishman for many years naturalised in Abyssinia, and now a chief of some importance, visited Aden a few years ago, and whilst staying with my friend above mentioned, administered a dose of the "kousso" with the happiest effect, to an officer of H. M. 17th Regiment. Mr. Coffin never traveled without a supply of the medicine, and even during his stay at Aden, took it regularly himself, and administered their customary doses to his attendants who had accompanied him.

I am not aware if the officers of the surveying vessels of the Indian navy, when employed on the coast of Abyssinia and Nubia, used the remedy or not. I believe they did, as I am aware that many of them suffered greatly from tape-worm: and one of the party, although eighteen years have elapsed, is not free from the disease even at the present day.—*Lancet*, *Sept. 7th*, 1850, *p.* 305.

[Mr. Vaughan says he feels satisfied that he will be able to procure a regular and constant supply of this drug in a very short time, and at a very cheap rate.]

47.—KOUSSO.—EXPULSION OF TÆNIA.

By Dr. Inglis, Halifax.

[As this is the first time kousso has been tried in the provinces, the following case may not be without interest.]

July 18, 1850.—Elizabeth Smith, aged 56, residing at No. 2, Carrier-street, Halifax, states, that some years previous to 1840, she had suffered from indigestion, as evinced by the usual symptoms: that in the early part of that year, the pain and uneasiness, from being general, became more fixed in the umbilical region, accompanied by a constant aching pain in the small of the back, and a frequent sense of extreme faintness. That in March, 1840, she had taken a largely diluted dose of Epsom salts, which, operating violently, brought off in the evacuation a portion of tape-worm fifteen yards in length. After this there was a temporary cessation of pain, but at the expiration of a fortnight, five yards more of the worm, unexpectedly, and without the aid of medicine, were ejected. From that time, till within the last two years, portions of tænia, varying from half a yard to seven yards in length, were expelled, either by the use of remedies or by voluntary effort. That the more acute symptoms have, within the last two years, gradually diminished, but that there has been the almost daily voidance of from sixty to twenty detached links of tænia, generally in the evacuations, but that not unfrequently portions protruded themselves, even when she had been passive or in a state of rest. The appetite has been capricious, never ravenous: and the bowels throughout have been regular, although rather inclining towards relaxation. The usual remedies have been administered, in a greater or less degree, during a period of ten years, and still there continues the daily discharge of portions of the worm, some of which have this day been examined by myself and my friend Mr. Bramley, with whom was last entrusted the treatment of the case The several portions of the tænia, when voided, have hitherto been alive.

July 19.—The dose of kousso having been infused for a quarter of an hour in twelve ounces of hot water, was taken at three separate draughts, an interval of five minutes elapsing between each, at a quarter past eight o'clock, a.m. The patient having taken the kousso as directed (fasting), a slight degree of nausea was induced, which, however, was soon relieved by a cup of weak tea, without either sugar or milk, and a little toast. Slight griping pains were felt in the bowels at a quarter past nine o'clock: and at half past nine o'clock there was a free, liquid, and dark evacuation, in which floated many detached portions of tænia. At ten o'clock, another large, dark, liquid motion brought with it the entire remaining portion of the tænia, the head and neck separated from the body, and the body, six yards in length, divided into equal lengths. Neither portion evinced any symptom of life, as the segments previously voided had done. A seidlitz draught was ordered in the afternoon, and a lavement of hot water to be used before going to bed.

July 20.—The bowels were frequently moved yesterday after the seidlitz-water, and the lavement was only retained about five minutes. The patient expresses herself this morning as perfectly free from pain: the bowels have been freely evacuated, but not the slightest trace of tænia could be discovered in any of the discharges since the voidance of the entire worm at ten o'clock yesterday morning.

P.S.—The kousso used with so much success was obtained from Messrs. Savory & Moore, of Bond street.—*Med. Times, July* 27, 1850, *p.* 83.

TREATMENT AND PREVENTION OF HABITUAL CONSTIPATION.

By Dr. J. C. Warren.

Fine flour is highly nutritious; and if exclusively used, like other nutritious substances, as jelly, arrowroot, milk, &c., causes costiveness. The artificial separation of the covering of the corn is counteractive of the intentions of nature, thus stimulating the intestine to expulsive action. After employing, with great advantage, bread containing the *bran* in his own family, and recommending it to numbers of others, the author was induced to try a still coarser preparation. Wheat was ground in a coffee-mill, and then boiled with a succession of water and a little salt for three or four hours. This Dr. Warren has found incalculably *the best and pleasantest remedy for constipation*, effecting quite a revolution in the economy and health, when taken in sufficient quantities (12 oz.), either as a part or whole of the breakfast, or instead of pudding and vegetables at dinner. When the stomach will bear sweet substances, honey, molasses, &c., may be added with advantage. A moderate degree of fluidity, i. e., less than that of boiled rice or hominy, increases the laxative power. The wheat acts in part by its mere bulk, and probably in part by reason of the stimulating effect of the sharp edges of the particles of bran.—*Amer. Journ. Med. Sc.*

[Although the fine bread so much consumed in towns is doubtless frequently a cause of constipation, yet brown bread, containing the bran, cannot be always indiscriminately substituted. Upon this point, M. Bouchardat has recently published ('Journal de Pharm. et de Chemie,' vol. xvii, p. 277, 1850), some interesting observations, in reply to an enquiry by the Paris municipality as to the propriety of substituting fine bread for the coarse brown supplied to the indigent. He observes that it is quite true, as stated by M. Millon, that by rejecting the outer covering of the corn, we reject a substance rich in gluten and fatty matter, and one which, except 10 per cent. of ligneous matter, is assimilable. Physiology also teaches us that a residue is requisite for the constitution of the alimentary bolus which is to traverse the canal. A natural condiment is prematurely removed when we reject the bran. But for the system to utilise this portion of the corn, the stomach must be capable of digesting it. An ox or a cow can assimilate it completely: and a country peasant, working freely exposed to air and light, and employed in fatiguing labour, digests his coarse bread easily, and utilises the bran completely. But if you give the same bread to poor and aged persons, the bran will traverse the canal unchanged, the soluble matters it contains being defended from solution by their strong cohesion, and by the covering of ligneous matter. For such persons white bread is alone suitable, and the same observation applies to other persons having weak digestive powers, who indeed, Dr. Warren says, are not able to take the boiled wheat in sufficient quantities. Ed. B. & F. M. Rev.]—*Brit. and For. Med. Chirurg. Review, Oct.*, 1850, *p.* 538.

ALIMENTATION.

An animated discussion on this important question is now going on at the Institute, between M. de Gasparin and M. Magendie; but science does not seem to have yet revealed to us her "last word;" and, accordingly, the opposing statements and theories of her servants only render the subject more obscure. M. de Gasparin still insists that the nutritive qualities of nutricious substances may be estimated according to the quantity of nitrogen which they contain. Here practice fully supports the theory. Practical farmers are well aware that ten pounds of hay are equivalent to six and a-half pounds of corn. Now, as the former contains about 1·15 per cent. of nitrogen, and the latter 1·77 per cent., it is evident that experience but confirms the results of analysis.

In the small towns of the south of France the workmen live alternately on meat and vegetables. Long experience has taught them the equivalents of each; and what are they? 250 parts of meat are equivalent to 150 parts of dry haricots. Now the former contains 2·42 per cent. of nitrogen, the latter 3·80 per cent.; and here, again, the theory is consonant to the results of experience. M. Magendie, to all this, replies by an experiment, which he regards as decisive. A carnivorous animal requires exactly the same weight of dried flesh for its support as raw flesh; but, as the food in drying loses nine-tenths of its weight without getting rid of any of its nitrogen, the animal fed on dried flesh consumes nine times more azote than the other.

The experiment, however, cannot be regarded as a fair one, because the dried powder may disturb digestion by the enormous absorption of fluid from the digestive canal. Besides, it is well known that travellers carry with them quantities of dried flesh, which they use by adding to it some water—thus obtaining a great economy of weight under the same amount of nutritious matter.—*Med. Times, July* 6, 1850, *p.* 20.

50.—ARTIFICIAL FEEDING.

By Dr. Churchill.

[The following article of diet is much recommended, and is called by the author "bread-jelly."]

"A quantity of the soft part of a loaf is broken up; and boiling water being poured upon it, it is covered and allowed to steep for some time; the water is then strained off completely and fresh water added, and the whole placed on the fire and allowed to boil slowly for some time, until it becomes smooth; the water is then pressed out, and the bread on cooling forms a thick jelly, a portion of which is to be mixed with milk or water and sugar for use as it is wanted. The steeping in hot water, and the subsequent boiling, removes all the noxious matters used in making the bread, and it both agrees very well with the child, and the child likes it very much."

[Dr. Gumprecht, of Hamburg, called the attention of the profession to a novel kind of food, viz., "carrot-pap."]

Wakenroder gives the following analysis of the expressed and inspissated juice of the carrot:

Oil fatty	1·00	Sugar	93
Oil ætherial		Malic acid	
Albumen, veg.	4·35	Starch	
Karotin	0·34	Lime	
		Alumina	
		Oxide of iron.	

But as the scraped root of the carrot contains other matters than the above, especially a large quantity of ligneous substance, which cannot be digested, and which will remain often two or three days in the intestinal canal before being discharged, and be highly detrimental to the delicate mucous membrane of children, it becomes important to separate that which will be useful from that which will not. Gumprecht advises an ounce of finely-scraped full-grown carrot to be mixed with two cupfuls of cold soft water, and allowed to stand for twelve hours, being frequently stirred during this period. The fluid portion is then to be strained off, what remains being pressed to yield some more.—This fluid is then to be mixed with the proper quantity of biscuit powder, or bruised crust of bread, or arrowroot, &c., and the pap placed over a slow fire, until it begins to bubble. Care must be taken that the heating be not pushed so far as to cause boiling, or the albumen will coagulate. After its removal from the fire, it is to be sweetened with a due amount of white sugar. Dr. Gumprecht states that by mixing the carrot juice with biscuit, crust of bread, or arrowroot and sugar, we obtain all the farinaceous and nutritious elements required, viz., albumen, gluten, starch, sugar, fat, and the phosphates of lime and magnesia. This food is more particularly adapted for children who have been suckled and are being weaned; for those who are being brought up by hand the following preparation is deemed more advisable: an ounce of *very-finely* scraped yellow carrot, and two drachms of biscuit-powder are to be mixed with two cupfuls of cold soft water. This must stand in a covered vessel, in a cool place, for twelve hours, and be frequently stirred during this time. It is then to be drawn off, or strained through a linen cloth. Some sugar-candy and a pinch of salt are to be added to the fluid, which may then be administered by means of the sucking-bottle; care being taken that the food is at the proper temperature.—*Brit. and For. Medico-Chirurg. Review, July* 1850, *p*. 137.

[The above preparations of the carrot as diet are contra-indicated when there is any tendency to diarrhœa.]

51.—INTESTINAL DISCHARGES IN MALIGNANT CHOLERA.

[In a letter to the editor of 'The Lancet,' Mr. George Lowther, of Hull, comments upon the following passage from the concluding lecture of Mr, Simon, on Paludal Poison and Cholera:—"The eliminative acts excited by the poison of cholera, are among the most violent manifestations of disease, stripping off the epithelium of the intestinal canal, and purging forth serum by stool and vomit, with a rapidity which literally desiccates, and shrivels the patient, so that his blood, by reason of its extreme inspissation, is rendered incapable of its normal function. Dr. Lowther remarks:]

During the prevalence of cholera in Hull, I had an opportunity of examining the varied manifestations of this fearful malady, and my observations were not restricted, but, on the contrary, comprised innumerable cases, and if my attention was directed to one set of phenomena more than another, it was to the nature of the intestinal discharges.

Now, if by the term serum, Mr. Simon intends to imply that the discharges differ in no respect from the fluid, strictly so called, which forms so large a component of the blood, my experiments lead me to differ from him entirely.

With scarcely an exception, I submitted the discharges to the test, by a careful examination, and although in every instance free alkali existed, in no case could I detect the presence of the smallest proportion of albumen.

On the contrary, should Mr. Simon intend to designate the intestinal effusions, charged with alkaloid salts only, by the term serum, then the phrase must necessarily tend to create considerable ambiguity.

Were the term serosity substituted for that of serum, in reference to the intestinal fluxes, it might be calculated to convey a more definite meaning.—*Lancet, Sept*. 21, 1850, *p*. 357.

DISEASES OF THE URINARY ORGANS.

52.—EFFECTS OF EXCRETION IN THE TREATMENT OF DISEASE.

By John Simon, Esq., F. R. S., &c.

Evacuative drugs have held the most important rank in the *Materia-medica*: and there have been times, even in the modern history of practice, when the balance of medical opinion has inclined itself towards the imagination, that by appropriate evacuants any conceivable disease might be expelled from the body, in form of urine, sweat, stool, or vomit. All scientific generalisations, especially such as fall within scope of the popular eye, become liable to these preposterous excesses of application; but it would be a fatal mistake for the interests of medicine, if, on account of such extravagances, we refused to recognise those invaluable indications which may be derived from a careful study, and a rational application of the humoral pathology.

Taking for granted, then, that we ought to follow the suggestions of nature as to the curative tendency of certain excretions, and that we ought, in a large variety of cases, to adapt our treatment to this evacuative purpose, you will perhaps think that the object is an easy one. You will remember the emmenagogues, the diuretics, the sudorifics, the cathartics, the sialagogues, the errhines, the expectorants, of the dispensary; and you will feel assured that, with these resources, you must be omnipotent against humoral diseases,—that with a pharmacopœia so plentiful, and so nicely arranged, your only difficulty can be that of selection—the merest *embarras de richesses*.

It will surprise you perhaps to be told, unless you have ascertained it in practice before coming to learn it from pathology, how very much delusion lies under cover of those fine names, and how singularly little real or useful power we possess over the organs of excretion.

If we inquire into the physiology of these organs, we find with them as with all others, that their natural stimulus is the blood: and we are able to say of them generally, that *cæteris paribus*, their activity of function varies proportionately to the abundance of blood traversing their capillary vessels. To increase the circulation of blood through an excretory organ would appear, then, an easy method of augmenting its characteristic excretions. In the abstract this may be true, but practically it has a very important qualification. The blood is capable of exciting in the several organs of excretion their appropriate acts, only because, by means of its own decomposition, it furnishes to the growing elements of each several organ that specific material which it is their function to appropriate and excrete. If, for instance, the blood were divested of the ingredients of urine, its circulation through the kidney would be fruitless. It is the law of those nucleated cells which form the bulk of all excreting organs, to grow and expand by the appropriation of certain specific materials, and of these only: a cell in the liver fills itself with one stuff; a cell in the kidney with another: and so long as the blood can give them this special pabulum, they grow more quickly and more abundantly, in proportion as their circulation is increased. But, on the other hand, the increased afflux of blood to an excreting organ can serve to stimulate that organ's excretory acts, only so long as the blood is ready to yield to the organ its characteristic materials for excretion. Hence it would appear probable that an excretion can be permanently augmented only by an increased formation of its characteristic materials in the blood; and that the artificial production of hyperæmia in an organ, apart from the condition just specified, could only give a moment's expedition to the process of discharge.

In this argument, I assume as an unquestioned fact, that eliminative organs *do not form* the materials which they excrete: that they merely appropriate from the blood certain elements which existed there previously to an act of excretion. The best illustration of this truth is given in the fact, that after absolute removal of both kidneys in the lower animals, urea rapidly accumulates in the blood, so as to become detectible by analysis, and soon in quantities sufficient to destroy life by narcotism; and we are constantly able to observe the same effect in the human subject, where the kidneys are so disorganized as to be incapable of purifying the blood.

It would appear, then, that while the blood, either mediately or immediately, undergoes those important chemical changes which result in its decomposition and decay, the products of this process have their preordained outlets from the body, and so fast as they arise, become evolved; each, as it were, at its own pole of a galvanic battery. I know nothing better to compare it with than the phenomena of galvanic decomposition: you see the blood distributed with uniform qualities throughout the whole area of the circulation, and you see the products of its decomposition appearing with their characteristic signs at the liver, the kidney, the skin; just as, when you plunge the wires of your battery into a trough of water, you get oxygen evolved at one pole, and hydrogen at the other, while the intermediate material remains apparently unchanged. And to apply that analogy somewhat further (though by the way, I must beg you to understand that it is merely chosen for illustration sake, and that I have no intention of suggesting to you that the vital process in question is of an electrical nature) I would point out this for your notice: as you are quite sure in decomposing water, that for every volume of hydrogen at one pole, there must be a corresponding half volume of oxygen at the other, —as you are quite sure that, if the gas be not evolved, it must have spent itself oxidizing the metal of that opposite wire, so with the manifestations of secretion. You cannot deal with them singly; if the essential ingredients of urine, bile, or sweat, be formed in excess, you are quite sure that certain other ingredients *complementary* to them must have been formed in excess likewise. Supposing for a moment, that the liver and the kidney were the only organs to be considered, it would be a chemical impossibility for the blood to furnish material for one of these glands without likewise evolving, as a necessary residue of that process, the characteristic elements of the other secretion. As an obvious illustration of this, I may cite an interesting observation by Dr. Bence Jones, in respect of the digestive process: when much acid was secreted by the stomach, the urine was found to be alkaline: the excess of acid in the stomach was hydrochloric, and the free alkali in the urine was fixed alkali and not ammonia: in extreme cases the alkalinity lasted for four hours: as the free acid was absorbed from the stomach, the urine became acid; and this reaction increased, until it affected litmus paper intensely.

It would appear, then, that the only natural means, for giving increased development to any particular excretory function of the body, would consist in providing for the increased formation of certain specific materials within the blood; and that this increased formation cannot possibly arise as a single local process, but must involve an affection of the entire chemical economy. And it would appear further, that an augmented determination of blood to the excreting organ can only serve to facilitate the process, in proportion as that fluid has previously been charged with the materials to be eliminated.

Now, all the power that we possess of increasing, or appearing to increase, individual excretions, by means of medicine acting through the blood, admits of explanation on the principles which I have stated. We add to the blood the ingredient of some one secretion, or more; and in the increased secretions we find the pharmaceutical material which we have given. Here, however I ought to state to you that the appropriating power of the various excretive organs is not limited to the exact materials of their normal stinulants. A certain lattitude of operation is allowed, and very few chemical agents (if any) can enter the blood without finding, as it were, some road prepared for their escape from the system—some organ or other ready for their excretion. Thus for instance, iodide of potassium is quite foreign to the animal economy; it has no counterpart in any natural excretion: but so soon as a sufficient quantity has been taken to impregnate the blood, it immediately begins to excite the kidney and to be largely eliminated by it. Accordingly iodide of potassium (as well as various other salts) though perhaps inferior in diuretic force to the natural constituents of the urine, may certainly be considered as acting in the same manner and under the same law.

But how far may this fairly be called increasing the excretion of urine? Suppose, for instance, that half a drachm of nitrate of potass be taken daily by a person in good health; suppose this continued for a fortnight; what will be the total result? More blood will have traversed the kidney; more water will have been secreted: and that waste of water will have been repaired by an increased thirst, calling for drink in proportion; and the increased flow of water will have carried off with it the nitrate of potass, and for the first twenty-four hours will have appeared to increase the urea and the lithates; that is to say, it will have given facilities for their elimination: it will have washed out the tubules of the kidney, and have cleared away all that there was to be cleared; but, except in that almost mechanical process, it will have done nothing for the characteristic excretions of the gland. The urine of the fortnight would be, so far as we know, only the ordinary urine in all respects but one; in addition to its ordinary constituents, it would contain seven drachms of nitrate of potass and a certain additional quantity of water—if, at least, water had been taken in proportion to the thirst. Most of our milder diuretics let their action be resolved into this: that the excretion excited by them consists of the drug itself, *plus* water.

Under the influence of more violent diuretics (such as cantharides or cubebs) given in large doses, so as to cause great irritation of the gland, something different occurs: the excretion is evidently hurried: it contains albumen and tubular epithelium—often blood; it presents at first an increase of lithic acid, apparently at the expense of the urea, and subsequently a decrease of both these ingredients. Finally, so soon as the kidney is relieved from the continuance of these irritating drugs, the specific gravity of the urine (which has already begun to decline in spite of the largest doses) suddenly falls to 1007 or 1008, is quite destitute of lithic acid, and contains exceedingly little urea. These facts (given by Heller as the result of observations carefully made by himself at Vienna) show that the extreme action of the so-called diuretics consists in bringing away the products of urinary excretion in an immature state, mixed with the evidences of inflammation; but they render it little probable, that any purificative action can thus be exerted on the blood; and Krahmer, after performing on himself a hundred and three experiments, of which forty-one were with the so-called diuretic, found that on the whole he passed more urea, more lithic acid, and more of the other solid constituents of urine, without the exhibition of those drugs than with their assistance.

But are there no means, you will ask, of increasing the flow of *real* urine? Can we do no more than add water? Can we invent no real and genuine diuretic, which shall make the urine stronger in its specific ingredients, as well as more plentiful in its flow? Undoubtedly we can, though perhaps in a very different sense to that supposed in asking the question:—*e. g.*, Lehmann, a German analytical chemist, found that by exercise he could increase the proportion of urea in his urine from about 30 in the 1000 to upwards of 45.

I say this is not quite the sort of result wanted, because I presume the giver of diuretics expects that his drugs shall be *specially* and exclusively diuretic; whereas, in the case just quoted, the effects of exercise, no doubt, were to be traced in very many other secretions; in sweat, bile, and so forth. It was, in fact, an illustration of what I have already stated to you, that such secretions are secondary results of a previous chemical change in the blood; the strong exercise and attendant waste of muscle, the increased oxidation of blood, the profuse perspiration, all these were elements in the production of that increased renal secretion. The kidney secretes all urea that is brought to it, and on this occasion, more than usual was brought, because of other chemical changes passing simultaneously in the system. But I can give you another case from the same chemist. He took a scruple of *Thein* (the alkaloid principle of tea) at bed-time; the next morning he found his urine contained about twenty per cent more than its normal quantity of urea. This would, at first sight, appear a case of true diuresis; and as nothing is said of other secretions, I will assume that they were not increased; but if you will call to mind the chemical constitution of the principle referred to, you will see that in the course of oxidation, it might easily reduce itself to the very formula of urea; and I cannot but suspect that something of this sort must have occurred with it, while within the blood; and that thus, reaching the kidney, not as thein, but as urea, it merely appeared in the urine just as if in the latter form it had been artificially injected into the veins. The same effect is produced, and in the same manner, by the injection of lithate of ammonia into the veins, or by its reception in the stomach; for as it enters the circulation, and becomes oxidized, part of it is transformed into urea, part into oxalic acid; both which materials make their appearance in the urine.

I have chosen the kidney for these illustrations, because we have good opportunities of watching its excretory acts; and, likewise, because in practice you will hear a great deal about diuretics, and it is as well that you should know how much, or rather, how little, can be done with them. And while I am on this subject, I may show you, as a practical inference, from what I have been stating—a distinction as to the cases in which diuretics can usefully be employed. Suppose that you have a case of ascites dependent on disease of the heart or liver, and you give nitrate of potass, or acetate of potass, or turpentine, as a diuretic, you will have your drug carried off by the kidneys, and with it an increased quantity of water; and if you press your remedy, you will by degrees drain off a considerable quantity of the peritoneal effusion. And in such a case, your diuretic may possibly be a well chosen remedy. But suppose the case to be one of effusion (more generally anasarca) from disease of the kidneys; such anasarca, for instance, as often accompanies Bright's disease; and if it were proposed to give a saline diuretic, you would, I hope, repudiate the proposal. If the blood were examined in such a case, you would find it already containing more than its proportion of the natural diuretic salts; competent knowledge of morbid anatomy would tell you that these are detained in the blood only because of the diminished secreting structure of the kidney; and the addition of a diuretic drug to the blood could do nothing but increase its unnatural state, and perhaps aggravate the kidney-disease by the determination of a larger flow of unavailable blood. It is in such cases as this, that diuretics add materially to the sufferings of the patient, causing albuminuria or hemorrhage.

I believe that what I have stated with regard to the kidney applies equally to all excreting organs: that their best stimulants are their own characteristic excretions; that if these exist in the blood, no extraneous stimulation can be so effective as they, for exciting the organ to which they belong; that if they do not exist in the blood, no special stimulant of the organ which ought to evolve them can do more—even in its highest doses, than bring away from that organ the results of an immature excretory process, admixed with those of inflammatory excitement.

The next question in the pathology of excretion is this: can one excreting organ act vicariously for another? Can the kidneys act for the skin, or the skin for the bowels? or, in short, what does occur when a particular secretion is arrested? A great many cases of the kind are talked of, but, on circumstantial inquiry, they appear very unsatisfactory. As far as I can ascertain the truth, it appears to be thus: when a secretion is suppressed, if there be in the body another organ naturally evolving similar, or partially similar, materials, that organ will, *so far as the agreement of material extends*, but *no further*, adapt itself to the necessity of increased action. And organs which in this manner naturally secrete very similar materials, may be considered (but, again only so far as the similarity extends) to antagonise one another's activity. Thus, in respect of water, the skin naturally antagonises the kidney; if the skin sweat profusely, the urine will be in small quantity; if the urine be excessive (as in diabetes) the skin becomes dry. Accordingly, in the treatment of disease, the skin may be made to transpire a great proportion of water which otherwise would be discharged by the kidney: but the skin would be quite incompetent to relieve the kidney by eliminating urea for it, because that material does not naturally enter into the cutaneous secretion. Probably the only instance in which the relief can be complete is where there are double organs (kidneys, breasts, testicles, for instance) and where, after the loss of one, the surviving other acquires an increase of activity that prevents the system from suffering inconvenience.

In other cases, all the material which cannot escape by the natural excretory surface, or by some other in affinity with it, accumulates in the circulation sometimes to a considerable extent; and then, as all secretions are evolved from the transuded liquor sanguinis, all become more or less contaminated with this retained product, though none are sufficient to discharge it from the system.

But, though the instances of true vicariousness in secretion scarcely extend beyond the discharge of water, yet there are some instances—or, at least, one good one—of compensative secretion approaching very nearly to the vicarious character. You are probably aware that diarrhœa and vomiting are very common incidents in the progress of Bright's disease, when the function of the kidney is much interfered with; and from the recent experiments of two French physiologists, I suppose this symptom must be considered a case in point. Messieurs Bernard and Barreswill extirpated the kidneys of dogs, and watched the result. It consisted of two stages; there was a first stage, marked by increased gastric and intestinal secretion, especially the former; and this new secretion, instead of being periodic, as the ordinary digestive secretion is—instead of having any definite relation to the meals of the animal, went on continuously, just as the secretion of urine would do. During this stage, which lasted above two days, the animal appeared well, digested his food properly, and had no trace of urea in the blood. The second stage was marked by the cessation of this gastric secretion, and by the appearance and accumulation of urea in the blood, which presently produced its characteristic poisonous effects on the brain, and soon killed the animal.

Now; thus far the case looks as if—at least, in the earlier stage of the experiment, the gastro-intestinal mucous membrane had taken on itself the function of the kidney, and had eliminated urea. However, it had not accomplished this vicarious secretion: it had not discharged urea, for the fluid contents of the stomach and intestines were carefully examined, without betraying a trace of that substance; but they contained a very large quantity of ammoniacal salts, naturally foreign to them—so large a quantity, that it was impossible to doubt that the urea had undergone in the blood that transformation into carbonate of ammonia to which it is so prone, and had in this form effected its escape into the intestinal canal. It appeared, however, in all the experiments, that this compensative action could not long go on; the intestinal membrane was apparently unable to keep pace with the necessities of the system, and death soon ensued.

Some pathologists have believed that certain changes in the liver may be considered compensative for previous interference with the lung; as, for instance, where enlargement of the liver or its fatty degeneration occur in connexion with phthisis, or with defective oxygenisation of the blood in hot climates, and under other circumstances of extreme bodily inaction, as with the celebrated Strasburg geese. There is room for doubt in respect of these cases, and especially as to the first of them, for fatty degeneration of the liver often occurs independently of disease in the lung, and, when in connexion with it, is not by any means invariably proportionate to the pulmonary disease. Nor is it, as on this theory it should be, equally a concomitant of the other chronic pulmonary disease: it attaches itself to phthisis by reason apparently of the diathesis in what that complaint arises, not by reason of the interference with respiration, which it eventually produces. Still, I think it may be admitted in general terms, that the elimination of hydro-carbon at the liver will increase when the blood is imperfectly aerated at the lungs, and this may be considered a compensative action, facilitated no doubt (according to a rule I have already given you) by a certain natural similarity in the chemical functions of the two organs.

So far, then, as we have hitherto advanced with the pathology of excretion generally, the following principles would appear established:—

1. One organ can excrete for another only such materials as are common to both. All organs can excrete water, and perhaps certain salts, for one another. Thus far—*i. e.*, in respect of such materials as are common to both—one organ may be said in health to antagonise, or in disease to act vicariously, for another, but no further. There may be a sanguineous derivation from one to another, but not a substitution of activity.

2. To a very limited extent, certain retained excretions may undergo in the blood a chemical change, which brings them within the means of appropriation of some other organ than that to which they specially belong; thus in the experiments I cited, urea for a time seemed to be excreted from the system by the mucous membrane of the stomach—not, indeed, as urea, but as carbonate of ammonia; thus, again, carbon and hydrogen, when incapable of passing off in their respective gaseous combinations seem liable to be secreted as fat.

3. By means of drugs having special organic affinities—such as cubebs for the kidney, elaterium for the intestines, arsenic for the stomach—we are able almost indefinitely to produce and accelerate, in the excreting surfaces of the body, certain changes, which tend in each case to eliminate the particular drug with more or less aqueous exudation; but which fail to augment, or at the utmost, only momentarily augment, the discharge of material specific to the surface. And,

4. As these accelerated molecular changes always involve the occurrence of artificial hyperæmia, so we may expect, and we do really find, that excretions thus abnormally excited will always contain evidence of the congestion we have induced, presenting (just like inflammatory effusions) the several grades of albuminous admixture, to which presently the fibrin of the blood, and subsequently its coloured particles, are added in increasing proportion. Under the influence (*e. g.*) of cholera or elaterium, there is set up along the mucous surface of the intestines, a condition of molecular excitement under the ope-

ration of which they first shed their mature epithelium; next, a profusion of unripe epithelial growth, giving the re-actions of albumen, and floated in a profusion of water; next, a fluid which constantly becomes more like the serum of the blood: contains flakes of coagulated fibrin, and often gives evidence of the rupture of capillary blood-vessels.

And as regards the practical application of these powers, it is obvious that by means of them, as by a blister to the skin, we can effect very decided derivations of blood—can render one surface vascular, more or less, at the expense of another; we can likewise carry away, by any of the excretory surfaces, an indefinite quantity of a fluid possessing more or less, according to the degree of stimulation, the chemical characters of serum. But the derivative processes thus induced are so essentially of an inflammatory nature, that we ought very much to hesitate in having recourse to them needlessly or violently; and above all, in respect of solid and complicated organs of excretion, such as the liver and kidney, where every inflammatory excitement leaves its permanent traces of mischief, we ought not to select them for the working of this vicarious irritation without the fullest conviction of necessity.

From the ground we have already gone over, you will have gathered misgivings, that with some show of power against humoral diseases we really possess extremely little true and available influence. For while unquestionably we are enabled to determine blood to this organ, or to that; while we can confidently ensure that our senna shall pass out by one channel, our cantharides by another, and in either case carry serum with them; we find this ability of little service in respect of humoral disease, by reason of what I have already explained to you. If rheumatic fever forms with explosive rapidity certain materials *congenial* to the excretion of skin and kidney, the use of diaphoretics and diuretics is obviously superfluous; and in the latter more complex organ, any such treatment would of necessity do more harm than good. We see the solid materials of the urine largely increased in rheumatic fever: we have the clearest evidence that the material already in the blood is a most efficient diuretic; so efficient, that not infrequently, like cantharides, it produces hyperæmia enough to cause the excretion of albumen or of blood; and we are acquainted with no medicine (unless water be so considered) which can at all facilitate the process thus energetically commenced by nature. Derivatively we may act no doubt on the mucous membrane of the intestines, and may establish there a counter-irritation in relief of the inflamed organs; but against that which is specific in the malady, our purgatives are utterly powerless, and apparently contribute no more to vent its distinguishing "peccant humors," than, in a case of suppression of urine, they would suffice to eliminate urea from the system. Whether a material, seeking to pass off by the skin and kidneys, be normal or abnormal; whether it be urea or that animal matter which loads the excretions of our rheumatic patients, we have no sufficient reason for believing that we can convert that diuretic material into one voidable by the intestines. By any excreting organ we can only evolve those elements which have a specific and elective affinity for its action; and where this affinity prevails, I repeat that the elements themselves work their own discharge with at least sufficient rapidity. Obviously then, if the science of medicine is to find the means of affecting the course of humoral disorders, we must look further into the operation of drugs than the superficial evidence of their various local affinities. Our only known power of qualifying the specific materials of any excretion lies much deeper in the subject. It lies in such means as we possess for accelerating and retarding the waste of tissues and blood, or that metamorphosis of their material which sooner or later furnishes the elements of discharge. At the head of these means stands bodily exercise, with its attendant increase of oxygenisation, as the natural and by far the most efficient stimulus of the organs of excretion. As to the question, whether there are any drugs which control this process, either to increase or diminish it: here exactly it is that our ignorance displays itself, and that we find our inability to cope with the difficult problems of humoral pathology.

It seems probable that *water* promotes these changes in their normal direction: Becquerel found that, by increasing its use, he could likewise increase the true urinary excretion—that of urea.

There are reasons for believing that mercury occasions in the blood that dissolution of certain materials which is preliminary to their excretion; for first of all (just as with a true humoral disease) there is a period of general uneasiness and febrility; this presently gives way to a second stage of its influence, in which a variety of excretory acts occur with unusual activity; while any effused inflammatory products tend to re-enter the blood, and their fibrin undergoes disintegration. It is not easy to say, whether these phenomena are in the normal direction of chemical change, and whether they effect all the retrogressive elements of the blood; but in one respect the excretions thus evolved obviously differ from the more leisurely productions at the same surfaces—they are more fœtid, and therefore probably less oxidized. Likewise, as with all excited excretions, they are apt to become inflammatory; in mercurial ptyalism the saliva is abundantly albuminous.

Antimony seems likewise, and in the same manner, to accelerate the destructive metamorphoses of the blood; and indeed (since the recent researches of Dr. Mayerhofer) we know more about it than about other drugs of the same class. Without materially altering the proportion of coloured corpuscles in the blood it produces a marked diminution in its other solid ingredients, and reduces the fibrin to about a third of its usual quantity. Co-incidently with this change occur the various known acts of increased excretion; and in the urine (which has been especially examined) the waste products of the economy are found in excess—especially the urea, of which there is discharged half as much again as is normal.

What other drugs may act in this manner I am unable with certainty to inform you; but when you find any which, like these, tend to affect several excretions simultaneously, you may have reason to suspect that such is their *modus operandi*,

Such drugs, then, as mercury and antimony, when introduced into the circulation, represent exactly the phenomena of true humoral diseases; they effect or hasten a definite metamorphosis in the blood, under the influence of which the materials for excretion become sensibly increased; they do not stimulate the organs on which they act by means of any specific affinity between those organs and themselves (as cubebs stimulated the kidney) but excite their actions indirectly, evolving for their use, from the elements of the blood, a larger proportion of that which it is their normal function to eliminate; and (unlike those evacuative drugs which effect their purpose solely by reason of their local affinities) these *catalytic* medicines, if I may venture to call them so, do not merely add themselves to the excretion which they provoke, as nitrate of potass adds itself to the urine; for no quantity of mercury mixed with saliva would render that fluid fœtid.

Some medicines are said to affect the excretions without having previously entered the circulation. Poiseuille has endeavoured to explain the purgative action of certain saline medicines as a simple phenomenon of exosmosis. He parodied a purge with his endosmometer; he found that serum would pass out of it, through animal membrane, into solutions of sulphate of soda, into seidlitz water, into sea water. The profuse discharge which follows an ounce-dose of sulphate of magnesia consists of nothing more than the ordinary excrements with the addition of the purgative salt and of serum from the blood vessels. Therefore, at first view, there is nothing in the facts inconsistent with Poiseulle's theory; and an Italian physiologist (Dr. Bachetti) has given further development to the doctrine, by showing that the exosmosis of serum into the saline solution is very much increased when an artificial current is kept up, which (just like the circulation of blood in the living body) constantly brings new portions of the albuminous fluid within the sphere of attraction of the saline one. It is argued further, that one single salt will act as a purgative or as a diuretic, according to its dilution; will purge (by exosmosis of serum) if it be given with little water; will be absorbed and act on the kidneys, if the proportion of water be largely increased. There is much plausibility in all this, but I doubt if it will bear accurate inquiry. No dilution of sulphate of magnesia prevents it from being a purgative when given in sufficient quantity. No concentration of syrup, or of mucilage, will convert these agents into purgatives, as (on the above theory) it apparently should. I have given half an ounce of nitrate of potass twice and three times a day, in a tumbler of water, without producing that purgative effect, which, (in respect of its density, and by comparison with sulphate of magnesia) should be expected from its exosmotic influence. The cathartic mineral waters are of very much lower specific gravity than the serum of the blood; of lower specific gravity even than the serum would be in respect of its saline contents alone. Half an ounce of sulphate of magnesia, taken in solution, and acting as a purge, brings away with it far more than enough water to reduce it below the specific gravity of the serum. It seems almost certain, by reason of these objections, that the exosmotic theory of the action of purgatives is an insufficient one. Probably they all enter the circulation; and the difference of action resolves into this; that the kidney suffices, without the aid of another organ, to discharge any small quantity of them which may be in the blood; but if their presence be more copious, the intestinal canal co-operates for their discharge. To this it must be added, that many saline medicines, like other drugs, have definite local affinities, and maintain their adhesion to one eliminative organ, without any regard to differences of dose or dilution; nitrate and iodide of potassium (short of poisonous doses) are not convertible into purgatives; nor am I aware that any dilution of sulphate of magnesia will render it a diuretic.—*Lancet, August* 17, 1850, *p.* 150.

53.—PROXIMATE CAUSE OF ALBUMINOUS URINE AND DROPSY, AND PATHOLOGY OF THE RENAL BLOOD VESSELS IN BRIGHT'S DISEASE.

By Dr. George Johnson, Assistant Physician to King's College Hospital.

[Dr. Johnson has already stated, in his communications on the subject of renal pathology, his views on the morbid changes occurring in the secreting cells of the kidney, and his opinion is now confirmed, that the various forms of disease generally included under the name of Bright's disease, and which are, in most instances, associated with an albuminous state of the urine, have this common feature, that "the first morbid change which can be detected in the kidney, consists in an altered condition of the secreting cells." Although we do not possess a complete and accurate history of the secreting cells of the kidney, yet before entering upon the immediate subject of his present communication, Dr. Johnson mentions briefly certain facts connected with them. He says:]

1st. The true secreting cells occupy the inner surface of the convoluted tubes, those portions of the tubes which form the great mass of the cortical substance of the kidney. Neither the Malphigian bodies nor the straight tubes which form the medullary cones contain the true glandular or secreting epithelium.

2nd. No renal cells can be detected in normal and healthy urine. The presence of renal epithelium in the urine affords unequivocal evidence that the secreted products are abnormal. Thus, for example, when during an attack of jaundice the kidneys eliminate bile, the urine contains renal cells deeply tinged with biliary matter. The bile conveyed by the blood to the kidneys has so modified the secreting cells that they are thrown off entire, and thus appear in the secretion. Various other matters produce a similar modified action of the secreting cells of the kidney,—the fever poisons, particularly that of scarlatina, of measles, and of erysipelas,—certain morbid matters which infect the blood of persons who have had repeated attacks of gout,—others which exist in the blood of cholera patients,—and, again, others which result from an insufficient supply of nutritious food. In these and in some other cases, which do not require special mention, although the poisons are recognised only by their effects, while their essential nature is unknown, there is yet abundant evidence to justify a belief in their existence.

3rd. But it is not only by a process of desquamation that the kidney-cells afford evidence of their having eliminated abnormal products. The cells undergo various other modifications which can be detected by a careful microscopical examination of the kidneys after death. They are sometimes gorged with oil, and this is a condition which may readily be detected by an examination of the urine during life, when, as frequently happens, the desquamative process accompanies it. In other cases the cells are remarkably opaque, and appear to contain an unusual quantity of a finely granular material. I have observed this condition in the kidneys of diabetic subjects, in which cases, probably, the long continued secretion of sugar has modified the action and appearance of the cells. It is of the utmost importance to bear in mind, that there is a most intimate relationship between a secreting-cell and its secreted product,—there is reason to believe, that a change in one will be invariably accompanied by a corresponding modification of the other.

The various changes in the secreting-cells, just now enumerated, produce one common result; viz. an imperfect elimination of the renal secretion. The acute desquamative process rapidly fills the tubes with epithelial cells. The chronic desquamation destroys the life of the cells, arrests their reproduction, and leaves the tubes denuded. The fatty engorgement of the cells tends to obstruct the tubes, and so to impede secretion; and probably each visible deviation from the normal appearance of the epithelial cells is attended by a corresponding imperfection in the performance of their function.

There are, besides, certain other morbid conditions, such as the replacing of the normal epithelium by a deposit of pus or unorganized fibrin in the tubes, which tend to the same result as the more common changes before mentioned. In every instance, excretion is imperfectly performed, and the urinary constituents are partially retained in the blood.

From these preliminary remarks, I pass on to the main subject of this communication, which is to offer an explanation of two of the most common and important symptoms of renal disease, viz., albuminous urine and dropsy; and this will lead me to describe a remarkable pathological condition of the blood-vessels of the kidney, which, so far as I know, has not hitherto been noticed. The observations which I have to offer on this subject will, perhaps, be rendered more intelligible by a previous brief reference to one of those lucid and valuable essays bequeathed to us by the late lamented Dr. John Reid. The essay to which I allude is that 'On the Order of Succession, in which the Vital Actions are arrested in Asphyxia.' The principal facts and arguments therein contained, and which concern us in our present inquiry, are the following:—when the trachea of an animal has been obstructed, by the insertion of a tube with a closed stop-cock, dark blood is at first transmitted freely through the lungs, and reaches the left side of the heart, by which it is driven through all the textures of the body. As the blood becomes more venous, its circulation through the vessels of the brain deranges the sensorial functions, and rapidly suspends them, so that the animal becomes unconscious of all external impressions. For about two minutes after the animal has become insensible, and when the blood in an exposed and unobstructed artery is equally dark as that in the accompanying vein, the large arteries become more distended and tense than before the stop-cock in the trachea was shut, and when the animal was breathing atmospheric air freely. At the same time, a hæmadynamometer being placed in the artery of one limb, and a similar instrument in the corresponding vein of the other, the former indicates an increase, and the latter a diminution of pressure, as compared with that observed in the same vessels before the air was excluded from the lungs, this evidently resulting from an impediment to the passage of the venous blood through the systemic capillaries. At the expiration of the time before mentioned, viz., about two minutes, the instrument in the artery indicates a diminution of pressure; the mercury, at first falling very gradually, and at last very rapidly, in consequence of the blood being arrested in the pulmonary capillaries, ceasing to pass through the lungs, and so stagnating in the right side of the heart and in the veins.

Dr. Reid then quotes some observations by Dr. Alison tending to show that the arrest of the blood in the pulmonary capillaries "is to be referred to an interesting law in physiology, by which the movement of nutritious juices is influenced by the chemical changes; or, as Dr. Alison terms them, the vital attractions connected with the chemical changes constantly going on in the capillary vessels between these juices and the surrounding tissues, by which nutrition and secretion are effected. Before arterial blood can be transmitted freely through any tissue or organ, it is not only necessary that the contractions of the heart be performed with a certain amount of force, but that the actions of nutrition and secretion be also in operation; so, in the same manner, before the blood can be transmitted through the lungs, it is not only necessary that the right side of the heart retain its contractility, but that the chemical changes between the blood and the atmospheric air should proceed." This doctrine is still further illustrated by Dr. Reid's experiment, before described, which demonstrates that when the blood in the systemic circulation becomes decidedly venous, it passes less freely through the capillaries into the veins.

Finally, Dr. Reid refers to some observations by Mr. Wharton Jones, which seem to accord with the explanation here given of the arrest of the pulmonary circulation during asphyxia. Mr. Jones observed, that when a solution of common salt, or a stream of carbonic acid gas, was applied to the lung of a living frog, the circulation of the blood was there arrested by the red corpuscles agglomerating together, and applying themselves here and there flat against the wall of the vessel. The same phenomena were observed, when a solution of common salt was applied to the web of a frog's foot.

The observations and inferences of Drs. Reid and Alison seem to be applicable, by the way of analogy, to the subject of renal disease, and will, I think, assist us in our attempt to arrive at the immediate cause of the albuminous condition of the urine and the general dropsy, which are so commonly associated with disease of the kidney.

In tracing the progress of a case of acute dropsy occurring as a consequence of scarlatina, it will commonly, but not invariably, be found that the patient has been exposed to cold. The natural process of elimination by the skin has thus been checked, and the poison is driven inwards to the kidney. It reaches the inter-tubular capillary plexus, and an effort is made to eliminate it by that modified action of the secreting cells which we have called desquamation. The cells are formed and shed rapidly and in large numbers: so that in the course of a few hours, many of the tubes may be completely filled by their accumulated solid contents. This condition of the tubes must obviously impede the secretory process; the blood is imperfectly purified, and excrementitious matters accumulate in it.

We have now to consider the influence which the materials, thus retained in the blood, exert upon the circulation through the kidneys. Assuming that the renal circulation is affected by an imperfect elimination of the urinary constituents in a manner analogous to that in which the pulmonary circulation is influenced by the retention of carbonic acid in the blood, we should expect to find, that the circulation would first be retarded in the inter-tubular capillary vessels, the obstruction, which will be in proportion to the extent of morbid change in the contiguous tubes and cells, will, of course, exert an influence extending backwards in the order of the circulation; so that the Malpighian capillaries and the arteries which supply them will become gorged with blood. This engorgement is exactly analogous to that of the right side of the heart and venous system observed in animals after death from asphixia.

There are certain facts which afford a remarkable confirmation of that which, as just now propounded, might seem to be a mere hypothesis, or at best only a probable analogy.

That the circulation through the inner-tubular capillaries is retarded, and that the Malpighian capillaries are consequently subjected to a greatly increased pressure and distension, seems to be indicated by the escape of serum and blood which so constantly occurs during an attack of acute desquamative nephritis following scarlet fever. The serum flows into the tubes, mingles with the urine, and renders it highly albuminous, while the colouring matter and fibrin coagulate in the tubes, and afterwards escape in the form of cylindrical moulds, in which epithelial cells are commonly entangled. There seems no reason to doubt, that the blood, in these cases escapes from the Malpighian capillaries, which lie within the dilated extremities of the tubes. The result is precisely similar to that obtained artificially by Dr. George Robinson, who observed, that when a ligature was placed upon the renal vein of a rabbit, the urine became albuminous and bloody. Dr. Robinson performed this experiment several times, and with an almost uniform result.

But still more satisfactory and conclusive evidence of impeded circulation, and of the precise point at which the impediment occurs, is afforded by the condition of the renal blood-vessels in cases of chronic disease of the kidney.

I have observed in all cases of chronic renal disease, which I have examined since my attention has been directed to the condition of the blood-vessels, that the coats of the arteries and of the Malpighian capillaries are remarkably hypertrophied, while the coats of the inter-tubular capillaries and of the emulgent vein present no appearances of hypertrophy or thickening. I have examined the vessels in different cases, both injected and uninjected, and I have compared them with corresponding vessels in the healthy kidney, and the result has been uniformly such as I have stated. I will now detail the appearances which I have observed in each of these sets of vessels, viz., the arteries, the Malpighian capillaries, the inter-tubular capillaries, and the veins.

Arteries.—I have observed, in accordance with the description which Henle has given of the arterial tunics, that the minute branches of the renal arteries have two fibrous coats, the inner being longitudinal, and the outer circular; in the healthy vessel the inner coat is thinner than the outer, but in the diseased condition, I have generally found them of nearly equal thickness. The two coats appear to be of the same nature, and in all probability they are muscular. The thickening appears to be proportionally greater in the smallest arteries, *e. g.*, the afferent vessels of the Malpighian bodies, and gradually diminishes in passing towards the arterial trunks. I have frequently observed the coats, at least three or four times exceeding the normal thickness. The canal of the artery is of the normal size; and pervious until the last stage of this interesting series of changes; when, the secreting cells in the tubes being destroyed, and their vital attraction upon the blood ceasing, the circulation is arrested, and oil globules collect here and there in the canal of the arteries.

Malpighian Capillaries.—What has been said of the arteries applies, with certain modifications, to the Malpighian capillaries. The capillaries do not, in the normal state, present a fibrous structure, nor is there any appearance of such tissue in the diseased vessels. The coats of these vessels are greatly thickened, but homogeneous in structure, and the canal is apparently normal, or perhaps slightly narrowed. The injection sometimes fills the Malpighian vessels very completely, in other instances the tuft is only partially filled; and again, in other cases, the injection proceeds no farther than the termination of the afferent artery. The entire Malpighian body is not sensibly enlarged, but the increased thickness of the capillary walls produces a close packing and crowding of the vessels, so that their outline can scarcely be distinguished. The surface of the vessels is usually smooth, and free from deposit, and the entire Malpighian body presents a peculiar whitish opaque appearance. A hasty examination might produce an impression, that the vessels are bloodless; and in the extreme stage they actually become so, presenting oil globules in or upon them, as already described in the arteries, the entire tuft being atrophied, and the capsule shrivelled: but in the majority of instances, the addition of acetic acid, by rendering the vessels transparent, will show the blood corpuscles within them: thus proving, that the blood had been concealed by the opaque and thickened capillary wall, and that the Malpighian vessels must not be hastily pronounced impervious or bloodless.

Inter-tubular Capillaries and Veins.—The coats of these vessels present no appearance of thickening or of any other morbid change; they seem to be less numerous than in the healthy kidney, and they probably become atrophied and obliterated, in consequence of the arrested action of the secreting cells.

The pathological explanation of these changes in the renal blood-vessels appear to be this. There is an imperfect elimination of the urinary constituents, in consequence of changes in the secreting cells, produced by an effort which they have made to excrete abnormal products. Deficient excretion at once leads to impeded circulation—the obstruction occurring at the very point where the excretion should be affected, viz., in the inter-tubular capillaries. The impediment reacts backwards upon the Malpighian capillaries, which in a suddan acute attack become ruptured, and allow the blood to escape into the urinary tubes; but when the disease has been of longer duration, they become thickened, and permit only the serum of the blood to escape. The thickening of the Malpighian capillaries is probably preservative, and is intended to enable them to bear the increased pressure to which they are subjected during the continuance of the disease.

The thickening of the arteries, which proceeds simultaneously with that of the Malpighian capillaries, affords support to the opinion entertained by some physiologists, that the smaller arteries exert a propulsive influence upon the blood. The remarkable hypertrophy of the muscular coats of these vessels seems to have for its object to assist in driving the blood onwards through the inter-tubular vessels in which the impediment exists. Finally, the gland-cells being destroyed, and the process of secretion arrested, the circulation ceases, the tubular tissue wastes, and oil-globules collect in the canals of the blood-vessels. This appears to be the order in which the various changes occur, and the probable relation which they bear to each other. So far as my observation has extended, the thickening of the vessels appears to be associated with all the forms of deposit in the tubes, and is in proportion to the degree in which the tubes and secreting cells are destroyed, as well as to the duration of the renal disease.

In recent acute cases, the appearances just now described are of course not observed. Hypertrophy of the left ventricle is undoubtedly a common result of disease in the aortic valves; but we do not expect to find hypertrophy after a recent attack of acute disease producing a deposit on the valves.

The subject of renal dropsy appears now to demand a brief notice. Analogy would indicate the very great probability, that this form of dropsy is produced by an impeded circulation through the systemic capillaries, consequent upon the retention of the urinary constituents in the blood, and that the obstruction thus originating is similar to that which Dr. Reid detected by the hæmadynamometer when black blood was circulating through the arteries of the animals which were the subjects of his experiments. There is one fact which, *per se*, is almost sufficient proof, that the systemic capillary circulation is actually impeded, in the way supposed, as a consequence of imperfect elimination of the urinary constituents. I allude to the frequent occurrence of hypertrophy of the left ventricle of the heart in cases of chronic renal dropsy, when there exists no obvious disease of the valves or vessels to account for such hypertrophy. The very frequent occurrence of cardiac and renal disease was long since pointed out by Dr. Bright. In passing under review the chief morbid appearances observed in one hundred cases of renal disease connected with albuminous urine, Dr. Bright thus alludes to the subject of cardiac disease. "The deviations from health in the heart are well worthy of observation; they have been so frequent as to show a most important and intimate connection with the disease of which we are treating; while, at the same time, there have been twenty-seven cases in which no disease could be detected, and six others which, from not having been noted, lead to the belief that no important deviation from the normal state existed. The obvious structural changes in the heart have consisted chiefly of hypertrophy, with or without valvular disease, and what is most striking, out of 52 cases of hypertrophy no valvular disease whatsoever could be detected in 34, but in eleven of these 34, more or less disease existed in the coats of the aorta; still, however, leaving twenty-three without any probable organic cause for the marked hypertrophy generally affecting the left ventricle. This naturally leads us to look for some less local cause, for the unusual efforts to which the heart has been impelled; and the two most ready solutions appear to be either that the altered quality of the blood affords irregular and unwonted stimulus to the organ immediately; or, that it so affects the minute and capillary circulation, as to render greater action necessary to force the blood through the distant subdivisions of the vascular system.

The latter of the two explanations thus suggested by Dr. Bright. is the one to which analogy would point as the true one. The existence of capillary obstruction being admitted, dropsical effusion appears to be a natural and necessary consequence. It follows, too, that an albuminous condition of the urine, and dropsical effusion into the areolar tissue and serous cavities, must result from precisely analogous conditions, viz., an arrest of poisoned blood in capillary vessels. The hypertrophy of the renal arterial tunics, and that of the left ventricle of the heart, must also be considered as analogous means of overcoming an obstacle to the passage of the blood. It will be evident, that the dropsies here referred to are those which result from an abnormal condition of the blood: renal disease being the most frequent, but by no means the only cause of such abnormal condition. The dropsies produced by disease of the heart, or lungs, or liver, or by pressure on a venous trunk, differ in some respects from those before alluded to; they are all, however, alike in this one important particular—*that an impeded circulation precedes and accompanies the dropsical effusion.*—*Medico-Chirurg. Transactions*, Vol. XXXIII, *p.* 107.

54.—ANIMAL CHEMISTRY IN ITS APPLICATION TO STOMACH AND RENAL DISEASES.

By Dr. H. Bence Jones, F. R. S., &c.

[The subject with which Dr. Jones commences his series of lectures is]

Food.—All substances, vegetable and animal, which are fitted to sustain animal life, consist of ingredients belonging to the four following divisions: 1st, water; 2nd, salts, or ashes; 3rd, organic substances containing very little or no nitrogen,—as fat, vegetable acids, starch, sugar, &c.; 4th, organic substances rich in nitrogen,—as fibrin, albumen, vegetable albumen, &c. No two different articles of food probably contain these ingredients in the same proportions; and, accordingly, they vary in their nutritive qualities, those being most nutritious which have the largest supply of nitrogenous compounds. But the absence of any of them is destructive of the perfect fitness of the substance as an article of diet, when taken by itself. "On olive-oil, linseed-oil, or cod-liver oil, an animal may grow fat, but he cannot work on such food alone. For the work of the muscles, it is requisite that the food should be albuminous, not fatty. A horse, for example, for hard work, must have corn, and not hay. To do work, food rich in nitrogen is necessary; to grow fat, food rich in carbon is required." But neither will nitrogenous substances alone suffice for food. Animals fed on white of egg died of starvation. There must be a due admixture of all. This is shown in the composition of milk, the type of the food for infants; and in that of wheat, which may equally be regarded as the type of the food for man, with this exception, that water is requisite in addition to the latter.

One great object of vegetables is to prepare the food for animals. "Vegetables, from the air, the water, and the soil, make compounds which animals require,—substances, that is, which, with the least possible change, can be formed into parts of the animal. Vegetables, from carbonic acid, ammonia, water and salts, form albuminous substances, fatty matters, starch, sugar, whereby the various organs of the body are nourished and enabled to perform their actions. The power of forming higher compounds out of more simple ones is, in vegetables, unlimited. Their power of thus compounding simple substances into more complex ones, is most extensive; whilst, in animals, the power of conversion is probably limited to a simplifying change,—the power of forming higher organic compounds out of lower ones is at present unproved. But, you might say, cannot animals make nervous substance,—the noblest substance in creation, whose action so utterly forbids our comprehension? If we examine this nervous substance, we find it also consists of the four classes, viz., albuminous substance, fatty substance, ash, and water; and the highly-organized muscle contains the same substances in different proportions. The power of animals is shown in their forming the substances which they obtain from vegetables into complex structures and organs; whilst the power of vegetables is shown in the production of new compounds, new arrangements of the elements into higher and more complex bodies,—as vegetable acids, alkaloids, neutral substances, albuminous and fatty matters. The power of adapting forms, and making organs, the formative and organizing power, is more seen in animals than in vegetables. The power of building up new compounds, new substances—the compounding, or substance-making power, is, with some exceptions, perhaps limited to vegetables."

Uric or Lithic Acid.—[According to Dr. Jones' observations,]

The uric acid exists in combination with ammonia, the urate of ammonia being modified in form and in solubility by the presence of common salt, and other saline substances. He has not been able to prove the existence of two compounds of uric acid and ammonia, and suspects that the super-salt, described by Dr. Bensch, was a mixture of uric acid and urate of ammonia. That the acidity of the urine is not caused by such a super-salt, as Dr. Prout supposed, is evident from the fact, that the variations of the ascidity of the urine and of the uric acid, instead of coinciding, have an inverse relation to each other: when the urine is very acid, there is usually but little urate of ammonia present; when there is much urate of ammonia, not unfrequently the urine is nearly alkaline.

The quantity of urate of ammonia varies remarkably during the day. A few hours after any food, the amount is increased; long after all food, it is excessively diminished. It is but little affected by differences in the kind of food. A slight excess or increase in the acidity of the urine will cause the precipitation of urate of ammonia. If it be highly acid, a precipitate may occur, even when no excess of the salt exists. If the urine tend to alkalescence, an excess of urate of ammonia will be dissolved, and will show no appearance of a superabundance of urates. The precipitation of uric acid crystals depends only on the acidity of the urine, and is quite independent of the quantity of the urate of ammonia excreted. They constitute by far the most delicate and trustworthy test of an over-acid state of the urine.

In regard to the treatment of these two kinds of deposit, Dr. Jones writes; "If uric acid crystals are present, there are two things to be done, namely, to give alkalies, and to forbid and remove all that may become acid. For the first, caustic alkalies, carbonated alkalies and earths, saline draughts, and phosphate of soda;—these must be regulated according to the peculiar symptoms of the patient: for the second, vegetable acid, sugar, and starch in the food, should as far as possible be prohibited. The removal of acids by the skin, and of carbonic acid by free respiration and exercise, is of still greater benefit; shortly the uric acid crystals indicate that acidity must be removed, neutralized, and prevented.

"When uric acid crystals are absent, and urate of ammonia is deposited alone, it is a proof that no great excess of acid is present in the urine, otherwise uric acid would be found; and though by lessening the ascidity of the urine, we can keep the urate of ammonia dissolved in it, and so hinder it from appearing, yet this is not the best mode of proceeding for effecting even this purpose.

An extra glass of water, or soda-water, or some slight diuretic, as nitre, is more sure to keep the urate of ammonia in solution by increasing the quantity of urine, and this is the best palliative treatment; whilst the curative treatment consists in lessening the quantity of food taken, by smaller meals, and in lessening the acidity of the urine, by increased exercise. Thus you will best prevent deposits of urate of ammonia, and the alkalies may be kept until uric acid crystals appear, when they are as necessary, as in the urate of ammonia deposits they are unnecessary, for the treatment."

Albuminous Urine.—[In commencing his observations upon this subject, Dr. Jones says:]

Heat and nitric acid together form the best, and indeed the only safe test for albumen, and the above is the order in which they should be employed. Either alone may give rise to mistakes. Dr. Jones very properly insists upon the importance of using a perfectly clean tube. A small quantity of strong acid will prevent the coagulation of the albumen by heat; and it even appears, that the same test may fail when the urine is very acid, without anything having been added to it. Albumen is never present in healthy urine, but by itself it merely indicates excessive congestion of some part of the urinary organs; to determine what disease is really present, the microscope must also be employed. By this means, we detect the presence of blood-corpsucles, or pus-globules, or fibrin.

If the fibrin be moulded into the urinary ducts of the kidney, and if albumen be also present, with or without blood-globules, there must be congestion of the cortical structure of the kidneys; and most probably the disease is Bright's disease, or the result of scarlet fever. If blood-globules be found, and no fibrinous cysts, it is most probably that the congestion is not in the secreting structure of the kidney; and if crystals of uric acid or oxalate of lime be seen, then probably some calculus is causing abrasion of the vessels of the mucous membrane. Whether the calculus is in the pelvis of the kidney, the ureter, the bladder, or prostate, must be determined by the general symptoms. The nature of the epithelium that occurs in the urine, will also sometimes help to determine this question. The occurrence of the blood only on exertion tends to confirm the diagnosis of a calculus. If pus-globules be found with albumen, then suppurative inflammation is going on; if, at the same time, fibrinous moulds are seen, then probably Bright's disease and inflammation of the pelvis co-exist. If there be no moulds, but blood-globules and pus-globules, then probably a calculus has caused not only abrasion, but inflammation of the mucous membrane. When fibrinous moulds, blood-corpuscles, pus-globules, albumen, and crystalline deposit were seen, then degeneration of the kidney, inflammation, and calculus, were found on post-mortem examination. In one case, Dr. Jones found the urine albuminous from spermatozoa.

A peculiar substance, closely relating to albumen, has also been found in the urine, as well as in the buffy coat of inflamed blood. It is not precipitated directly by heat, nor by nitric acid, but if, after boiling, the urine is cooled, the precipitate falls, and is re-dissolved by heat. The nature of this substance is detailed by Dr. Jones in the "Philosophical Transactions" for 1847.

Our author then relates the following interesting case: "The patient had for some time been passing the so-called chylous urine; but I have fully satisfied myself that the presence of fat in the urine, on which the white colour depends, is an accident only, and by no means the most peculiar part of the disease. The fat passes off in the urine, making it milky only after food: but previous to any food, albumen, fibrin, alkaline salts, and more rarely a few blood-globules, are thrown out by the kidneys, and their appearance in the urine depends on the increased force of the circulation, consequent on waking, on getting up, and on exertion; for, during sleep, the albumen, fibrin, &c., entirely disappear from the urine, and, by directing the patient to lie in bed, or to get up and exert himself, totally different kinds of urine were passed. When perfectly quiet, the albumen and fibrin were prevented from appearing in the urine; and, when he exerted himself before breakfast, these substances transuded in very considerable quantity. The urine sometimes, previous to any food, even formed a jelly-like clot, transparent, and perfectly free from the appearance of fat. I satisfied myself that the disease does not depend on chyle or on fat, but on a slight alteration in the state of the kidney, and on the circulation of the blood through it. Under treatment, the urine became perfectly healthy."

Diabetes and Diuresis.—The best tests for sugar in the urine, are the oxide of copper and oxide of silver. To a drachm of suspected urine, add two or three drops of a saturated solution of sulphate of copper, and then two drachms of caustic potash; the hydrated oxide of copper, which first is precipitated, re-dissolves if sugar or many other organic substances are present, becoming of an intense blue; and when heat is applied, if grape-sugar be present, the oxide of copper is rapidly reduced, and reddish-yellow sub-oxide of copper is precipitated. This reduction is effected by the carbon of the sugar. With cane-sugar, the changes do not take place until after a long application of the heat; and, under these circumstances, both uric acid and albumen will also effect a slow reduction of the oxide of copper. The rapidity of the change is consequently the test.

If silver be used, the following is the method to be employed. A few drops of a saturated solution of nitrate of silver are to be put in a test tube, and a single drop of caustic ammonia added; if a brownish oxide of silver fall, a single drop of the suspected urine is to be added, and the test-tube then heated, and its contents well shaken. In a few seconds the sides of the tube will be coated with silver, and the metallic lustre will be seen.

The theory of the disease is as yet unknown. Sugar, as we saw before, is constantly formed in the body from starch; from some cause, with which we are not acquainted, the progress of the starch may be arrested at this point. In cases where the urine is excessively acid, the changes have advanced another step as thus:—

In health the changes are, starch, dextrin, sugar, vegetable acid, carbonic acid. In excessive acidity; starch, dextrin, sugar, vegetable acid. In diabetes; starch, dextrin, sugar. But the starch taken in food cannot account for all the sugar in diabetic urine; for when the disease is fully established, total abstinence from starch and sugar will not cause the sugar entirely to disappear. Dr. Bensch has shown, that sugar of milk is invariably present in the milk of carnivorous animals fed exclusively on meat; and by boiling with water, the livers of animals fed exclusively on flesh have furnished positive proof of sugar.

There is a form of diabetes to which the term *insipidus* has been applied. In these cases, the urine contains a substance closely allied to sugar, but tasteless, and which may be converted into grape-sugar by the action of acids. In some cases of the ordinary disease, the urine has been found to contain these two saccharine bodies alternately; and therefore the term is a needless one.

The Relation of the Urine to the Food and the System.—[On this subject and the general method of its examination, Dr. Jones remarks:]

Any organ that is used must be repaired, and the substance that has been used must be removed. Take the muscles for example; the muscles consist of water, salts, non-nitrogenous fat, and a highly compound arrangement of carbon, hydrogen, nitrogen, oxygen, sulphur, and phosphorus. Carbonic acid, ammonia, water, sulphates, and phosphates are the last products of muscular action, and of the action of oxygen on the muscle. The intervening products, probably, are innumerable; as kreatin, kreatinine, uric acid, urea, choleic acid. Some of the products are thrown out of the body by the lungs, others by the kidneys. If the removal of some of these products by the lungs is stopped, the circulation through the lungs ceases in two minutes; the functions of the heart and brain are arrested, and from the mechanical stoppage in the lungs, death ensues. If their removal by the kidneys is stopped, in two days the patient is poisoned; the nerves and muscles are affected by the poison, and chemical death ensues. "If beef-steaks (the muscles of an ox) are given to one who has taken strong exercise, and is in perfect health, they are dissolved, and pass into the blood, and their chief use is to repair the muscle and nerves, not to form uric acid and urea, the constituents of the urine. The waste of the muscles, and other organs, passes off in the urine, whilst the food nourishes the wasting organs. Such I conceive to be the clearest ideas I can give you of the relation of the urine to the system, and to the food; and, theoretically, I consider this is the true healthy relation, and perhaps, in a state of full bodily labour, when enough food, and no more than enough, is taken, this may be the only relation; but provision has been made for too little labour and for too much food. If too much food is constantly taken, and too little exercise, plethora and hemorrhage must take place, if some escape for the excess of food be not provided. You have seen that the phosphates, urates, and sulphates are generally increased in the urine after food has been taken. If more food is taken than is required for the wants of the system, the excess is thrown out by the same organs that remove the waste of the muscles and other structures. If even excess of water alone is taken, the excess is thrown out partly, at least, by endosmotic laws not yet clearly applied. How the quantity of substances to be thrown out is determined, I do not yet distinctly see."

The great agent in effecting these changes is oxygen. Of this there are many familiar proofs, as the production of carbonate of potash in the urine after the citrate of potash has been taken. "Very lately Professor H. Rose, of Berlin ('Phil. Mag.,' July, 1849) has made some most interesting experiments on the inorganic constituents of organic bodies, chiefly as regards their degree of oxidation. He divides the degrees of oxidation into fully oxidized, partially oxidized, and unoxidized. He compares the food, the blood, the flesh, and the urine. The food, if it consists of wheat and other grain, contains organic substances, the inorganic constituents of which exist partly in an oxidized, partly in an unoxidized state. Vegetable food, then, is partially oxidized. The blood is a partially oxidized body. The flesh is a partially oxidized body: but the quantity of unoxidized matter in the blood is larger than in the flesh, and the quantity of fully oxidized matter is smaller in the blood than in the flesh. The urine is a perfect and fully oxidized substance. The inorganic constituents of the urine are as highly oxidized as it is possible for them to be."—*London Journal of Med. Science, Oct.* 1850, *p.* 957.

55.—HYPERTROPHY OF BOTH KIDNEYS IN A NEW-BORN INFANT.

By Rawson Senior, Esq., Batley.

[On the termination of a natural labour, Mr. Senior found that the infant, a full-grown male child, was in a state of complete asphyxia, which he supposed arose from the pressure of the umbilical cord, which was firmly entangled about its neck. All attempts at resuscitation were useless, as not the slightest action of the diaphragm took place. Upon manipulation, two solid indurated bodies were detected occupying the hypogastric and iliac regions, and presenting the appearance anteriorly of an unusually large liver; and laterally from the bulging out of the abdominal parietes, and from the position in the lumbar regions, indicating the probability of their being enormous kidneys. On a post-mortem examination being made, he says:]

The first thing attracting our notice was the close proximity anteriorly of the lateral edges of the two bodies, yet that they were contained in separate and distinct sacs. The one to the right was removed first, and it proved to be a kidney of immense size: it was weighed, and the weight of it was exactly *eight ounces.* The left one was not taken out of the house for the purpose of weighing; but, from its appearance, it could not have differed more than a drachm or two in weight. The supra-renal capsule was no larger than usual; and the investing tunic, though somewhat denser than we commonly find to be the case, was easily detached. The kidney was composed of numerous lobules, some large, others small: the larger ones forming the outer boundary, and the smaller ones occupying the notch or fissure; altogether giving it the shape of an irregular oval body. When laid open, a quantity of urinous fluid oozed forth from the tubules, but their appearance presented nothing remarkable, being of a palish red colour, as is found to be the case in the kidney in its normal condition. The blood-vessels, proportionally larger in the fœtus than in the adult, as we well know, were found to exceed that proportionate increase in size to some considerable extent, the emulgent vein especially. The ureters retained their accustomed size, and the bladder, liver, and the other abdominal contents, had a healthy appearance.

Upon a review of this singular case, we cannot but observe the disproportionate arrangement which existed between the kidney and its supra-renal capsule. I believe that we generally find the supra-renal capsule to a third the size of the kidney itself at birth: but here it did not correspond with the enlarged organ. But it would appear that compensation had been afforded to the blood-vessels, their calibre being much enlarged, and the great weight and remarkable size of the kidneys were doubtless inevitable results of the increase of development of the vascular system of the kidney,—the vital feeder of this important secreting and excreting structure; so that we may view the case as one of those singular freaks of nature which are now and then produced, demonstrative alike of her influence and agency in overburdening as well as nicely adapting organs so highly essential to the economy and integrity of the functions.—*Medical Times, Sept.* 7, 1850, *p.* 265.

STRYCHNIA IN PARALYSIS OF THE BLADDER.

By M. Lecluyse, of Toperinghe.

M. L. was called to a man of 68 years of age, who, after a day of excess, had retention of urine, which led to complete paralysis of the bladder. After trying all the ordinary methods, such as permanent catheter in the bladder; copaiba, turpentine, stimulating diuretics, cold douche, and cantharides, he gave strychnia internally. It was pushed as far as one grain in the day, and produced tetanic spasms in the muscles of the trunk and limbs, but left the bladder as thoroughly paralysed as ever. After fifteen days' abstinence from all treatment, he resolved to apply the strychnia in the form of injection into the bladder. For this purpose he dissolved six grains in alcohol, mixed this with a pound of water, and ordered four injections of two ounces each to be introduced through the catheter, after previously emptying the bladder. At first the bladder seemed insensible to the contact of the liquid, but after four or five days, the patient found himself wet with urine, though the fixed catheter was well closed, and he supposed that this was due to a fissure in the instrument. It was withdrawn for the purpose of being examined, and to the astonishment of both patient and surgeon, the urine flowed freely and well, and the patient recovered completely, with no other inconvenience than some momentary irritation, probably caused by the irritation of the catheter.

M. L. thinks himself warranted, from the length of time that elapsed between the internal administration of the strychnia, and the application of it by injection into the bladder, in concluding that the former had nothing to do with the cure.

[The following case will show how strychnia acts when injected into the bladder in a soluble and therefore absorbable form.]

A man, aged about 48, of good constitution, had paralysis of the bladder consequent upon a debauch. He remained three days without treatment, and the medical man who saw him, finding the urine dribbling away, mistook the case for one of incontinence of urine, and prescribed some trifling remedies. The patient was admitted into the Hôpital Beaujon under M. Robert, who finding that besides retention from paralysis, there were symptoms of cystitis, such as pain in the hypogastrium and kidneys, and purulent urine, ordered a bath, leeches to the perineum, and the use of the catheter twice daily. Having thus relieved the more urgent symptoms, he proposed to adopt M. Michon's practice of applying electricity, but not having an apparatus at hand, deferred it. In the meantime, M. Lecluyse's plan of injecting strychnia having been mentioned to him, he resolved to try it, but was advised to use it in smaller doses. He ordered three grains (twenty centigrammes) in six ounces of water. The strychnia not being soluble in this amount of water, the pupil in charge acting upon the principle—*corpora non agunt nisi soluta*—substituted sulphate of strychnia for the alkali itself. The injection was given; in a few minutes afterwards, the *interne* who had charge of the case, observed convulsive movements coming on, with opisthotonos, and especially spasms of the thoracic muscles, which alarmed him much. The bladder was immediately emptied, and washed out with tepid water. The symptoms did not become worse, they gradually diminished, but for some days the patient experienced spasms of thoracic muscles. The most remarkable fact is, that in spite of the severity of these symptoms, which indicated a great intensity of action on the part of the strychnia, the bladder did not recover its tonicity, but remained paralysed. The only appreciable change in this respect was, that it was remarked on th the third day, when the catheter was introduced, that the urine flowed w a little more force than before, but this was a very insignificant amelior The spasmodic affection of the chest continued, the patient was seize bloody expectoration (black mucous sputa, differing from those of pu and appearing to result from a sort of asphyxia,) symptoms of uri soon came on, and the patient died. There was no dissection—*Bull* rap.—*Monthly Journal of Med. Science, Aug.*, 1850, *p.* 176,

57.—ELECTRICITY IN PARALYSIS OF THE BLADDER.

By M. Michon, Surgeon of La Pitie.

[According to M. Michon's cases, electricity in this condition of the bladder, appears to be an efficacious remedy. The first case is that of a pedlar, aged 67, who was admitted on the 9th of October. It is stated, that after eight days' moderate wine drinking, although in apparent good health, he was disturbed in the night by a desire, but total inability to pass water. A surgeon introduced the catheter, drew off the urine, ordered twenty-five leeches to the perineum, and stimulant frictions, but for eight days the catheter was needed night and morning.]

When admitted under M. Michon, he had absolute impossibility of passing urine without the aid of the catheter, had no fever, and no pain beyond the uneasiness caused by the distension of the bladder. The day after admission the bladder was again emptied by means of a large catheter, which passed freely. There was no kind of stricture or obstruction, and the prostate was ascertained by the finger to be sound. The urine flowed from the catheter with a feeble jet, which gradually diminished as the bladder became emptied. It was necessary, in order to evacuate it, to make pressure on the hypogastric region. The patient's account of himself did not tend to show that there had been any previous want of power in the bladder; but M. Michon was inclined to suppose that it had been gradually losing tone from the man's advanced life, and that complete paralysis had followed from over distension on the night of his seizure. He was ordered demulcent drinks, laxative enemata, and the catheter twice daily. Two days after, the patient having suffered much from repletion of the bladder, M. Michon left the catheter in, to enable it to be evacuated more frequently without risk of injury to the urethra from less skilful hands. Injections of tepid water into the bladder, discharging the urine by the catheter every three hours. Vichy water, blister to the hypogastrium, cantharides liniment to the belly and thighs, were all tried without success. On the 6th November the patient had rigors and vomitings; the urine became turbid and ammoniacal, with a copious puriform deposit. The catheter was removed, and the febrile symptoms relieved by baths and emollient poultices. The urine remaining ammoniacal, acidulous injections were used, with the effect of slightly improving it, but the retention was as complete as ever. As the patient, towards the end of November, lost ground, M. Michon resolved to have recourse to other means, and tried the effect of electricity.

The method of applying the electricity was as follows:—A silver catheter was introduced into the bladder, and a female catheter introduced into the rectum, and made to rest upon the recto-vesical parietes; each of these catheters was connected with one of the poles of an electric machine, which was put at first in gentle action, and then continued briskly for two or three minutes. The patient experienced no pain, he felt only some slight prickling; the urine had to be drawn off twice in the succeeding twenty-four hours. The electricity was re-applied next day in the same manner,—the patient felt the prickling more acutely, but only in the rectum,—he felt nothing in the bladder. A third application of the electricity was made, the same sensations were experienced, but, as on the two former occasions, ceased immediately afterwards. On this night he felt a desire to make water, and accomplished it easily without the aid of the catheter. Next day he was up, and showed the urine which he had passed during the night. From that time he required no more catheterism, but the electricity was applied again for three successive days; it produced the same effects, only that the sensations were more acute, and that during its application the urine was projected from the catheter at each electric stroke. During the intervals the urine was passed at his will, and without difficulty; it rapidly lost the ammoniacal odour, and became limpid. The fever disappeared, the patient regained his strength, and after remaining in the hospital for three weeks without any urinary disorder, was of charged cured. He presented himself again in three weeks, at the request imp r. Michon, and was found to be quite well. It is proper to state, that one g the application of the electricity the catheter was not allowed to remons n contact with one single part of the bladder, but was moved gently over er surface of the organ.—*Monthly Jour. of Med. Science, Aug.*, 1850, *p.* 173.

SURGERY.

DISEASES OF JOINTS, FRACTURES, ETC.

58.—SCROFULOUS DISEASE OF THE JOINTS.

By Sir B. Brodie, F.R.S., &c.

[In Sir B. Brodie's new edition of his work, on 'Diseases of the Joints,' we find the following practical remarks on scrofulous disease of the hip-joint:]

"The practice which has appeared to me to be, on the whole, the best, is the following. An opening having been made with an abscess-lancet, the limb may be wrapped up in a flannel wrung out of hot water, and this may be continued until the first flow of matter has ceased, a poultice, or water dressing, being applied afterwards. In some instances, after a short time the discharge ceases; the orifice heals, and the puncture may then be repeated some time afterwards. But where the puncture has not become closed, I have never found any ill consequences to arise from its remaining open. On the contrary, I have no doubt that it is desirable that the wound should not be closed until the abscess has contracted, granulated, and healed from the bottom; and this is one reason for making, not a small puncture, but a free opening with an abscess-lancet. Another reason is, that the matter will escape readily without squeezing or pressure. *All rough manipulation is to be carefully avoided.* It produces hemorrhage into the cavity of the abscess, the ill consequences of which I have already pointed out; and, independently of this, it may excite inflammation of the cyst, attended, where the surface is extensive, with so much constitutional disturbance as to endanger the life of the patient at the time, and materially lessen the chance of his recovery afterwards.

"The treatment of the sinus which is left after the opening of an abscess may be comprised in a few words. If the orifice be disposed to heal prematurely, this may be prevented by the occasional application of the caustic potash, care being taken that the caustic does not enter the sinus itself; otherwise some simple ointment or a water dressing is all that is required. The old practice of probing a sinus scarcely ever affords us any useful information; nor does it in ordinary cases answer any other good purpose. On the other hand, by irritating the sinus, or even the joint itself, it is often productive of serious mischief. The same observation is applicable, but with greater force, to the use of stimulating injections. I do not believe that they promote the healing of sinuses under any circumstances; but with respect to those which are now under our consideration, there is no doubt that their operation is highly injurious. I saw a young man who nearly lost his life, in consequence of a surgeon having ventured to inject port wine into a sinus connected with some diseased or dead bone of the pelvis."

In the progress of this disease there are evidently several successive stages. The author is of opinion, that if the disease have not proceeded to suppuration, the patient may recover with a serviceable and moveable joint, even when a considerable portion of the cartilage has disappeared. Otherwise there is no recovery, except with anchylosis. The anchylosis is at first affected by soft substance. But afterwards perfect bony union takes place; so that when the bones composing the joint are divided by section, the cancellated structure of the one bone is seen continuously passing into that of the other.

The determination of the question of amputation in instances of this species of articular disease, Sir Benjamin Brodie makes to depend upon the point, whether or not there be indications of other tubercular disease in any of the internal organs. It too frequently happens, that when one diseased joint is removed by amputation, another becomes the seat of the same malady, or tubercular deposits in the lungs, the bronchial glands, or in the mesentery, finally destroy the patient. When there is any reason to apprehend such results, amputation, of course, is worse than useless.

[Speaking of the relations, character, and treatment of chronic diseases of the joints, connected with gout and rheumatic gout, Sir Bejamin remarks:]

I have stated that inflammation of the synovial membranes, as it presents itself under ordinary circumstances, may not unfrequently be traced to a gouty diathesis. It is so in numerous instances, in which, nevertheless, neither the patient nor his medical attendant would admit that there had ever been what is called 'a fit of the gout.' I have referred to rheumatism as a cause of inflammation of the synovial membranes in the other cases, and I have also adverted to a peculiar disease, of a very chronic character, which is generally supposed to bear some relation to both gout and rheumatism, and treated of under the name of rheumatic gout. In this disease, inflammation of the synovial membrane is the first of a series of changes which the joint undergoes, and which, in the course of years, ends in its entire disorganization.

"In the museum of St. George's Hospital there are many other specimens of joints similarly diseased. From these we learn that the lithate of soda is deposited in a variety of textures:—underneath the synovial membrane, on the bone near the margin of the cartilage—on the surface and in the substance of the cartilage; in the cancelli of the bone, and in the cellular tissue external to the joint. In one preparation of the patella, taken from a gouty subject, the cartilage is seen increased in thickness, and presenting a striated appearance, the striæ being at right angles to the articulating surface. In this case the cartilage is described in the catalogue as having been 'in its recent state softer and more yielding than natural, and having a tendency to break up into fibres.'

"Although the opportunities of examining the pathological condition of joints which are affected in this manner are only of occasional occurrence, there is no surgeon of much experience who has not seen many cases of the same disease in the living person, or who, having seen them, will not assent to the correctness of the observation which I have already made, that inflammation of the synovial membrane is the first of the series of changes which the joint undergoes. This is clearly indicated by the symptoms. The deposit of lithate of soda takes place only as the disease advances; and though it is a very frequent, it is not a constant occurrence. The absence of this deposit is not a proof of the absence of the gouty diathesis. An elderly gentleman was attended by Dr. Chambers and myself, labouring under well-marked symptoms of gouty disease. One of the effects produced was a chronic inflammation of the synovial membrane of one knee. The membrane was considerably thickened, and contained fluid. He had been in this state, sometimes better, sometimes worse, for some years. When living at his house in Scotland, he was seized with symptoms of acute phrenitis, of which he died. The body was examined by his medical attendant, Mr. Johnstone, who found the diseased joint distended with a dark-coloured glairy fluid, and the cartilages absorbed, but without any white incrustation.

"Indeed, in cases of gout generally, it is difficult to discover any rule by which the deposit of lithate of soda is regulated. One person had his fingers and toes distorted by gouty concretions, at the same time that deposits of the same kind are found in the larger joints, and in the subcutaneous cellular tissue in various parts of the body; while another person, who has been equally tormented by the gout with the former, is altogether free from this additional cause of distress. Probably much depends on the greater or less prevalence of soda in the system, the lithate of soda being an insoluble salt, and in this respect differing from the combinations of the lithic acid with the other alkalies. There is great reason to believe that many of those who are troubled with what are commonly called chalk-stones have much aggravated, if they have not actually produced the evil, by taking large quantities of soda for the purpose of correcting acidity of the stomach.

"The process by which the absorption of the harder textures takes place in these cases is manifestly very different from ulceration, and is altogether very remarkable. The cartilages disappear, so that the bones are exposed; but the latter present nothing corresponding to the appearance of a carious surface.

They bear evident marks of having been subjected to the influence of friction, appearing as if portions of their surface had been scraped off by a chisel. This is especially observable in the knee, where the motions of the joint are only in one direction, and less observable in the hip, where the motions are more various. But the results of friction on the living are very different from what they would be in the dead bone. There is no exposure of the cancellous structure; a process of repair goes on simultaneously with that of destruction, and the consequence is the formation of a hard and compact layer of bone, bearing no small resemblance to ivory, covering the cancellous structure, which must have been exposed otherwise.

"In one of the cases which have been just described, it was found that some new formation of bone, in the shape of small exostoses, had taken place at the margin of the articulating surfaces. I shall have occasion hereafter to refer to two other cases, in each of which portions of such newly-formed bone had been broken off by the motion of the joint, and become loose bodies in the articular cavity. In other cases, masses of new bone are laid on in one part, while the original bone is removed by absorption in another, so as completely to alter the form and character of the articulating surfaces.

"*On the symptoms of this disease.*—The individuals who are most liable to be thus affected by rheumatic gout, are those who have not been accustomed to much bodily exercise; and have at the same time led luxurious lives. I suspect that too great an indulgence in the use of animal food is even more likely to produce it than the free use of fermented or spirituous liquors, and that it is for this reason that it is frequently met with among porters and the upper servants of wealthy families.

"The disease is rarely confined to a single joint, and in most instances several joints are affected in succession. Often it shows itself in the first instance, in a joint of one of the fingers, which is observed to be slightly enlarged and stiff, with an occasional twinge of pain in it. Then, one after the other, other joints of the fingers are affected in the same manner. It was to this enlargement of the joints of the fingers that Dr. Haygarth gave the name of *nodosities*. The immediate cause of it seems to be a thickening of the synovial membrane, and probably in part an effusion of serum into its cavity. Afterwards the disease extends to the other and larger joints, sometimes to a greater, sometimes to a smaller number in succession. In those joints which are superficially situated, so as to admit of examination, fluid may be detected, the quantity of which, however, varies accordingly as the limb is exercised or kept quiet, and is seldom very large. The fluid is more perceptible in the first instance than it is afterwards, on account of the synovial membrane becoming thickened.

"The progress of the disease is generally very slow, so that many years may elapse before it reaches what may be regarded as its most advanced stage. Throughout the whole of its course, it causes no severe pain, but there are constant uneasy sensations, and much distress and inconvenience, in consequence of the joints becoming gradually more rigid and unfit for use. The patient, in addition to his local ailments, always suffers, in a greater or less degree, from the usual effects of dyspepsia, which are aggravated by want of exercise. He is liable to acidity of the stomach, and flatulence after his meals; is nervous and irritable; and every error as to diet, as well as all mental excitement, will produce an aggravation of both the constitutional and local symptoms.

"In a few instances, after having reached a certain point, the disease becomes stationary, or there may be apparently some degree of improvement. But except where it was treated in the very earliest stage, I do not recollect any one case in which there was anything approaching to a cure. In the majority of cases, the disease is progressive, the joints becoming more and more disorganised, sometimes with little, at other times with much, increase in size.

That increase, in this stage of the disease, depends not merely on the causes already mentioned, but also on a deposit of new bone in the neighbourhood, and sometimes on that of a gouty concretion in the surrounding cellular tissue. Anchylosis sometimes takes place as an ultimate result. There is little tendency to suppuration. I cannot say that abscess never forms, for I suppose that there are no morbid changes of any kind, in the course of which this may not possibly occur; and, indeed, in one of the cases which I have just recorded, it was believed that there were pus-globules mixed with the semifluid substance which the joint contained. But the formation of abscess in these cases certainly does not belong to the regular order of events, and must be regarded as a rare exception to the general rule. This is a remarkable circumstance in the history of the disease, and forms an important difference between it and the ordinary diseases to which the joints are liable.

"Distressing as such a malady must always be, harassing the patient as it does, year after year, with no prospect of a cure, still it is an evil varying very much in degree in different instances. In one individiual, a few joints only are affected, and these not to such an extent as to prevent him from taking a certain amount of exercise, and enjoying the advantages of social intercourse; in another, scarcely one joint of the extremities remains in a sound state; some are completely anchylosed, and others are so stiff as to be nearly useless. Nevertheless, the patient thus afflicted, a cripple, dependent on others for the means of locomotion, may live for years, reconciled to calamities which have gradually come upon him, and in the possession of a certain amount of comfort amid all his sufferings.

"*On the treatment of this disease.*—In the very commencement of this disease, before any actual disorganization has taken place, and while the joints affected are limited in number, I believe that much may be done towards preventing its further progress. The patient should be placed on a careful system of diet, partaking moderately of animal food, avoiding fruits, acids, raw vegetables and sugar, and taking little or no fermented or spirituous liquors. He should take exercise daily, so as to induce perspiration: and, if this cannot be readily accomplished, he may, with great advantage, once in a week or fortnight, make use of the hot-air bath. In addition to such careful management of himself, he may from time to time take alterative doses of the acetic extract of colchicum, combined with a small quantity of the mercurial pill, and occasional purgatives. Moderate doses of potash or magnesia may be given three or four hours after each of his principal meals, so as to neutralize any superabundant acid in the stomach. Soda should be carefully avoided, as tending, by its combination with the little acid, to form gouty concretions.

"According to circumstances, however, the treatment may be varied. Thus, when the patient is depressed, as sometimes happens by the use of colchicum, the mixture, composed of rhubarb, magnesia and ginger, sold under the name of 'Dr. Gregory's Powder,' may be taken every night, with an active aperient at stated intervals, and very great benefit will often be obtained from a very long perseverance in the use of these simple remedies.

"Little is to be done by local applications. If, however, there be more than usual pain in a point, leeches may be applied, and, on particular occasions, a bandage, not for the purpose of making pressure, but of limiting motion. In some instances, a light leathern splint, or pair of splints, may be employed with advantage.

"When the disease is fully established, the same kind of treatment will be useful in mitigating its symptoms, and sometimes in retarding its progress. But here, the more active remedies, such as mercury and colchicum, must be reserved for special occasions. The iodide of potassium has the reputation of being useful in cases of this description; and I believe that its reputation is not wholly undeserved. It should be given only in small doses of two or three grains twice daily, but taken if it agrees with the patient, for several weeks at a time.

"But, after all, no general rule can be laid down as a guide for the practitioner on all occasions. Each individual case forms a study in itself, not only for the medical attendant, but for the patient also.

"In one case, in which the patient was afflicted with this disease in a very aggravated form (so many joints being affected, that she lay almost helpless on a sofa, and various methods of treatment having being already employed to no purpose), having learned that cod-liver oil had been formerly supposed to be useful in some forms of rheumatism, I was tempted to prescribe this remedy for her. The purified oil was administered internally, and at the same time rubbed in as a liniment on the affected joints. It was a mere experiment; but there is certainly great reason to believe that it was not altogether unsuccessful. Not only did the disease cease to make progress, but, when I last saw the patient, after she had taken and rubbed in the oil, with occasional intermissions, during a period of seven or eight months, there was a distinct and manifest improvement as to all the symptoms. Indeed, the result was such, that, to any other patient under the same combination of circumstances, I shall certainly be disposed to recommend a trial of the same remedy."—*Edin. Med. and Surg. Journal, Oct.* 1850, *p.* 445.

59.—DISEASES OF ARTICULAR CARTILAGES.

By Dr. Redfern, Examiner at the University and King's College, Aberdeen, &c.

Dr. Redfern ventures to advance what will to many appear a most improbable supposition,—namely, that the *pain* which is commonly accounted an indication of disease in articular cartilage, is not to be so regarded; but that it is to be attributed to the implication of some other texture. This is a very important point in diagnosis. Dr. R. says:

"Now, if it be true, that disease having the same essential structural characters in all cases, at times goes on to the complete destruction of the texture, without the patient or his attendant being aware of its existence; and in others, causes such violent pain and hectic irritation in the system as to require amputation, the fact is of extreme importance, as, so far as I know, no similar occurrence takes place in any other texture whatever.

"I shall not presume to deny, that uncomplicated disease of articular cartilages produces excessive pain, since this is stated very positively on the high authority of Sir B. Brodie, and by most surgical writers. And yet, on looking over the numerous cases which have been related by Sir B. Brodie and other authors, I find but few which will aid in the determination of the question. Uncomplicated disease of cartilage is of very rare occurrence, if we exclude the cases of fibrous degeneration, and carefully collected reports of numerous cases, with histological examinations, are necessary to establish a fact so decidedly at variance with everything we know of disease and its characters in other textures. This will appear more evident from the following considerations.

"1st. Nerves have never been found in cartilages, and there is not the slightest reason for believing that they contain any, for they give no evidence of sensibility in man or in animals on being exposed or sliced away. The cuticle, enamel, and the substance of the brain are in a similar position. They contain no nerves, and give no indications of sensibility, when parts are removed, or otherwise destroyed. Moreover, it is well known to every pathologist, that an immense portion of the whole bulk of the cerebrum may be utterly destroyed by disease, without a single recognised symptom or other mark of the existence of the lesion. Hence the value of pain.

"2d. It is certain that disease of cartilages may go on for years, and even be cured by the efforts of nature without the knowledge of the patient, and that the essential characters of such disease are similar to those of other diseases of the same tissue, which are supposed to be the cause of excessive and exhausting pain.

"3d. The symptoms supposed to indicate disease in the cartilages are so closely allied to those produced by affections of the bones, that a positive diagnosis is very difficult to make until the bone becomes exposed, and then the symptoms are, at least, as easily attributable to the disease in the bone as to that in the cartilage. Indeed, M. Richet, in the work before named, when entirely ignorant of the real nature of the changes which take place in diseased articular cartilages, gives several good anatomical and other reasons why the symptoms supposed to arise from disease in them should be referred to the bones.

"4th. Pus has never been shown to be formed from the substance of diseased articular cartilages, nor from effusions into their texture. At the time when pus is formed in joints, the pain becomes very severe, though there may have been but little previously, the very formation of pus indicating that other textures than the cartilage are affected, aud that the pain proceeds from the disease in them."

In order to test and extend the information derived from the observation of disease in man, Dr. Redfern has performed a series of experiments upon the cartilages of the lower animals; these experiments were continued during a whole year, and were nearly ninety in number: the progress of each one was carefully watched and recorded from day to day; and on the death of the animal, a lengthened microscopical examination was made of every texture in the neighbourhood of the parts operated on. The results of similar experiments were always found to correspond, when performed upon animals of the same species, in all cases of which some accidental occurrence had not taken place, such as the supervention of acute inflammation in the joints, pressure on the articular surfaces resulting from dislocations, &c.; and thus they admit of being generalized with considerable precision. We must forbear entering, however, into the minuter differences which distinguished the results obtained on the cartilages of the ribs, the sternum, the ear, the nasal septum, and the joints, when these were subjected to irritations of various kinds, such as the making of incisions into them, the insertion of setons, the application of ligatures, actual cautery, acids, or alkalies; but shall cite Dr. Redfern's account of the phenomena common to all.

"When changes are induced in the costal, articular, or nasal cartilages, by any cause whatever, they are essentially similar in all cases, and affect both the cells and inter-cellular substance. The cells become enlarged, rounded, or oblong, and irregularly arranged; their nuclei giving place to a multitude of corpuscles, or to a series of granules. The walls of the cells next become identified with the hyaline substance, when the corpuscles are set free, and begin to undergo other changes, elongating and becoming very evidently converted into the nuclear fibres of fibrous tissue, or reduced to small patches of granules, which may only become visible on acting upon the fibrous mass by acetic acid. During the enlargement of the cells, and especially at the period of discharge of their contents, the hyaline matrix becomes softened, and allows the corpuscles to be freely moved in it, or pressed out altogether; whilst, at a subsequent period, fibres appear in the interspaces of the corpuscles, and take on the characters of those of the white fibrous tissue. In this way, both elements of the cartilage are concerned in the formation of the fibrous membrane, which is destined to heal the breach in the tissue, for the hyaline substance is converted into the white fibres, and the corpuscles of the cells into nuclear or elastic fibres.—Or, an altogether different result may take place, especially in the case of articular cartilages, the whole thickness being converted into a calcareous mass; the cartilage cells becoming lacunæ, and calcareous matter being also deposited in the inter-cellular substance, rendering it dark and incapable of transmitting the light, the surface all the while remaining perfectly smooth and on its former level."

This production of a dense fibrous membrane, or of smooth calcareous lamina, appears to be nature's method of effecting a spontaneous cure; the tendency to which is very decided in uncomplicated lesions of cartilage, especially in such as have been artificially induced. In no case do these changes seem to extend further into the healthy cartilage surrounding an injured spot, than appears necessary for the formation of sufficient fibrous texture to constitute the cicatrix. It is a remarkable result of Dr. Redfern's inquiries, that these changes occur much less rapidly after incisions, than they do after great irritations; so that even after seven weeks, the texture of incised cartilages presented very trifling alterations. Hence the belief has arisen in the minds of many observers, even Dr. Leidy being among them, that the two surfaces of an incised cartilage never unite. In Dr. Redfern's experience, however, it was always found that the changes consequent upon incision were of the same kind with those following upon irritation, although more tardy in their rate of progress; and that, if sufficient time was given, they would go on to the production of perfect fibrous tissue, and thus to the reunion of the divided surfaces.

The fibrous tissue, which heals up breaches in the texture of cartilages, may contain (according to Dr. Redfern) the yellow as well as the white fibrous elements; the latter being formed by the elongation of the discharged corpuscles of diseased cells into nuclear fibres; whilst the former originate in the altered hyaline substance. All these results are in precise accordance with the inferences drawn from the study of the human articular cartilage in states of disease; and each set of observations thus affords a valuable corroboration to the other.—*Brit. and For. Medico-Chirurg. Review, July*, 1850, *p.* 177.

[The conclusions to which this learned author has arrived are as follows:]

1. That the whole of the known forms of disease in articular cartilages are connected with changes in the texture, which are essentially similar to each other.

2. That during the progress of these changes, the cells of the cartilage become enlarged, rounded, and filled with corpuscles in lieu of healthy cells, bursting subsequently, and discharging their contents into the texture on the surface; whilst the hyaline substance splits into bands and fibres, the changed hyaline substance and the discharged corpuscles of the cells afterwards forming in many cases, a fibro-nucleated membrane on the surface of the diseased cartilage.

3. That these changes are alone referable to an anormal nutrition as their immediate cause, and in no case to mechanical or chemical actions, such as attrition or digestion in a diseased secretion.

4. That most extensive disease may be going on in many joints at the same time, and may proceed to destroy the whole thickness of the cartilage in particular parts, without the patient's knowledge, and whilst he is engaged in an active occupation.

5. That the disease commences most frequently upon the free surface; but it may proceed from the bone to affect the attached surface, or it may take place in the middle of the thickness of the cartilage.

6. That it is at least very doubtful, if the symptoms which are believed to indicate the existence of ulceration of articular cartilages, are not really dependent on a morbid change in the bone.

7. That disease of the whole thickness of an articular cartilage, at particular parts, admits of a natural cure, by the formation of a fibro-nucleated membrane from the substance of the cartilage, without the occurrence of any new exudation.—*London Journal of Med., June*, 1850, *p.* 568.

60.—HIP-JOINT DISEASE TREATED BY COD-LIVER OIL, AT ST. THOMAS'S HOSPITAL.

Reported by Dr. C. Kidd.

[Dr. K. having seen several cases of this disease improved under the use of cod-liver oil, thinks it of such practical importance as to deserve a few passing remarks. The general opinion of surgeons seems to be, that this disease is not of mere local origin, but indicative of defective bodily powers,—taking blood, even by leeches, at the commencement being often attended by evil results. Sea-air, tonics, especially the mild proto-salts of iron, given for a long time, with occasional intermissions, and cod-liver oil, are the means trusted to in London. In illustration of these remarks, Dr. Kidd describes three cases, and he says several others could be added, in which the benefit derived from the cod-liver oil treatment was highly satisfactory. Dr. Kidd, pointing out rest as one of the chief indications to be fulfilled, if possible, recommends that the patient should be put upon one of Earle's beds, and the greatest attention paid to his bodily comforts so as to prevent restlessness. If the disease is so advanced that abscess has formed, of course we can look for nothing better than anchylosis, and even this it may take years to effect. Speaking of the treatment of abscesses about the hip-joint from this cause, Dr. Kidd remarks:]

In puncturing abscesses about the hip-joint, great care must be taken; all kinds of rude or rough surgery avoided; and the abscess allowed to empty gradually. Where anchylosis is all we can look for, much devolves on the surgeon in keeping the limb in the best position; for the patient, if left to himself, will infallibly bend it at a right angle. The proper position is, of course, that of the thigh bent a very small degree forwards,—the limb will be not only thus more useful, but less probability is incurred of its getting on the dorsum of the ilium. A simple gutta percha splint, embracing one side of the pelvis, about half the circumference of the thigh, and extending below the knee, is all the appliance necessary. When there is great pain, a seton or blister will be found useful.

As to the rationale of the *modus operandi* of cod-liver oil in this disease, perhaps the best way of explaining it, is by saying it changes that abnormal molecular condition of the blood so well known to exist in these cases, and so often connected with scrofula and other constitutional causes. To say there is ulceration of cartilages in some of the worse cases, as we long ago thought, would of course be at present a little heterodox. Cartilage under the microscope has no vessels, and consists essentially of true cells, as was long since shown by Schwann, and in this country by Mr. Toynbee; but that *diseased* cartilage is not vascular, is possibly open to doubt. Softening of the cartilage of the hip-joint is not uncommon, and forms, perhaps, one of the earlier states of the disease under inquiry. The cells become enlarged, softer, and contain nuclei; chondrin changes into gelatine—these changes being preliminary to what we will call ulceration—that scrofula, syphilis, rheumatism, often produce these changes is also very probable. Mr. Birkett and others explain these changes, I need scarcely add, by saying, "disintegration" takes place, in which the development of fat plays no unimportant part. In this observation, we do not, perhaps, get rid of the difficulty; and may ask, with Sir Benjamin Brodie, whether ulceration, in whatever part of the body it takes place, is not essentially a process of disintegration, depending on a want of proper vital nutritive power. If this be the truth, the operation of cod-liver oil is not such a puzzle. Iodine has not been found of as great use in so-called scrofulous disease of joints as iron—an idea which agrees with an opinion now gaining ground, that the former interferes with the protein-forming power of the system, and is not the active principle of the oil—from having an opposite effect.—*Med. Times, July* 27, 1850, *p.* 89.

61.—REMOVAL OF THE HEAD OF THE FEMUR AT ST. BARTHOLOMEW HOSPITAL.

By —— Skey, Esq.

Ann Sugg, æt. 13, fell over a skipping-rope about three years ago, and received some slight contusions about her left hip; inflammation of the joint followed: she was unable to use the limb, and suffered a great deal of pain in the knee. About a year after the accident she was able to limp about, but could only get the *toes* of her left foot to the ground, as she was unable to extend the knee or hip joints. In a few months abscesses formed around the hip, and burst: and for the last seven months some of them have remained open.

June 6th, 1850.—Admitted into St. Bartholomew's Hospital in an extremely emaciated condition, and nearly worn out with suffering. The left femur was dislocated on the dorsum ilii, the limb shortened, and the leg and thigh flexed: there was a large ulcerated surface over the trochanter major, through which the bone threatened to protrude, with burrowing sinuses in the neighbourhood discharging pus freely. After being in the hospital a few weeks the child gained a little flesh, but she has lately fallen off again, not being able to stand the pain and continued discharge of matter from the wound. It was considered that removing the head of the bone would give the patient the best chance of recovery: and the operation was performed on August 17th, by Mr. Skey, the patient being under the influence of chloroform. As the end of the bone was only thinly covered with granulations, a very little cutting sufficed to expose it; this being accomplished, the limb was carried inwards, and the bone divided with the saw just below the great trochanter. The granulations bled freely on being cut, but the hemorrhage soon ceased, and no ligatures were required. The integuments were too firmly adherent to the parts beneath to admit of being drawn together; the wound was therefore left open.

The acetabulum was found to have been enlarged by absorption, and was extended in a direction upwards and backwards, as if an attempt had been made by nature to form a new joint in this direction. The head of the femur had been entirely absorbed: a portion of the neck remained, which with the great trochanter, was the part removed: on dividing this with the saw it was found to be soft, and composed of vascular cancellous structure, with a very thin outer layer of compact bone.—*Med. Gazette, Aug.* 30. 1850, *p.* 382.

62.—DISEASE OF THE ELBOW-JOINT; PECULIAR METHOD FOR OBTAINING SPEEDY ANCHYLOSIS.

Under the care of Mr. Gay, at the Royal Free Hospital.

[The editor of "The Lancet" observes that it is only by carefully collecting the facts bearing upon this important mode of treatment, that we can throw some light upon the result obtained, and for this reason we present the following case, under the treatment of Mr. Gay.]

The patient whom we recently saw in the surgical ward, is twenty-nine years of age, of light complexion, and a rather nervous temperament. Four years ago he felt a stiffness of the elbow-joint, and an abscess subsequently formed in the under part of the fore-arm, about two inches from the elbow; it was opened, discharged for two months, and healed. The patient returned to his usual occupations, though the joint remained stiff, but about four months before admission, the joint swelled and became again painful upon the slightest movement. He was then treated as out-patient to the hospital, and a large abscess formed on the outside of the arm, about two inches from the elbow, which was opened by Mr. Jackson, the house-surgeon. It discharged a considerable quantity of thick, curdy matter, and, as the opening contracted, it was laid open again three weeks afterwards, when the patient was admitted into the hospital.

The joint was now enlarged, very painful, both when moved or compressed, and on rubbing the bones entering into the formation of the joint against each other, no doubt could exist but that the cartilages were gone. The patient's health was at this time much impaired, and the question of amputation was discussed. Mr. Gay preferred, however, adopting a plan which he has successfully employed in similar cases for some years past—viz., that of freely opening the joint by an incision along its outer side. This measure was at once carried into execution, the length of the incision being about two inches and a half. A large quantity of pus escaped, and the finger passed in through the diseased capsule could readily detect the rough and denuded ends of the humerus and ulna. The wound was filled with lint, and the arm lightly bandaged: the subsequent fever was very slight, and the discharge, which was rather abundant, continued about one week. At this time it considerably diminished, the fever abated, and the joint begun to be somewhat rigid. Mr. Gay prescribed tonics and a generous diet; directed water-dressing to the wound, and the arm to be pretty firmly bandaged. From this time the sore assumed a healthy appearance, the size of the joint diminished, it became stiff, and at the expiration of three weeks anchylosis was perfect. During this period, two sinuses, one running up under the integuments of the arm, the other under those of the fore arm, required free opening, but these incisions soon united perfectly.

Mr. Gay has adopted this mode of treating diseased joints (viz., when the cartilages are ulcerating) for many years past; in two cases of disease of the elbow-joint, similar to the above related, this peculiar treatment was, some time ago, followed with similarly successful results; and we noticed a patient, affected with disease of the wrist-joint, who was admitted about the same time as the one whose case we have just reported, with whom the joint was opened by an incision over the posterior and inferior end of the ulna. Here, again, a large quantity of pus was discharged, and no unfavourable symptoms followed; the hand was laid on a splint, and after one month the discharge ceased, the wound healed, and anchylosis by soft fibrous tissue took place. The man, who had entirely lost the use of his hand, was now regaining much power over it.

It should be mentioned, however, that in a case of disease of the joint of the great toe, between the metatarsal bone and the inner cuneiform, the results were not favourable; but in another case, of disease in the tarsal-joint, the termination was more successful. This last patient died afterwards of phthisis, but a post-mortem examination was unfortunately not permitted.

Mr. Gay has great confidence in the success of this plan of treatment in chronic diseases of the joints—in those cases, namely, where destruction of the articulation has taken place, and nothing can be obtained (supposing amputation be not performed) but a stiff joint. In support of this opinion, Mr. Gay considers, *in the first place*, that the consequences of opening *diseased* joints are not so serious as are usually represented, and are on the contrary, so slight as hardly to deserve notice. In most of the cases where Mr. Gay carried out this practice, the patient's general health was not in the slightest degree affected by the operation. In fact, diseased tissues, as previously stated, bear operative proceedings with less local or constitutional disturbance than is the case when sound parts are interfered with. A wound of a healthy joint may be followed by serious consequences, but it is not so with a diseased articulation.

Mr. Gay thinks, *in the second place*, that the process by which nature cures a joint in which the cartilages are removed by disease is anchylosis, but this eventual result demands the absence of cartilage. This object appears to be insured by the suppurative action which goes on in the interior of the joint, as well as the ulcerative processes which occur in the soft tissues external to the same. It is to the tardy manner in which such a process takes place that the constitutional symptoms are to be traced, for the pain which accompanies the ulceration of the capsule and external soft parts of the joint is generally very great, prolonged, and destructive of rest and appetite. No better example of the suffering consequent on matter pent up in a joint can be had than that of such an occurrence in the hip, as well as of the relief which an outlet of the matter affords. Mr. Gay, therefore, believes that laying open the joint as soon as an indication of a shedding of the cartilages is afforded allows the process of anchylosis to go on with greater rapidity, and with less detriment to the general health. The *debris* of the cartilages comes away with the more abundant suppuration which is thereby established; the restorative process follows, and is performed more speedily than in cases where the joint is left to itself.

Mr. Gay is, *in the third place*, of opinion, that the articulation is placed in the condition of a sinus which has been slit up. It is difficult to explain why a sinus having a single small aperture, and no diseased tissue in connexion with it, should refuse to heal: but such is the fact. Lay it fairly open, however, and the surface which has been pouring out tenacious serum, and appears covered with unhealthy granulations, which look as though the cells were distended with serum, assumes a healthy action, and cicatrizes. So it is with a diseased joint. Presuming that the cartilages have been shed, it may be said, that the joint refuses to assume the processes necessary to reparation, (as in the case of the sinus), until, by laying it fairly open, healthy action is established, and the joint thereby fixed, by the production of new ossific and uniting deposit. Such are Mr. Gay's arguments for opening joints when the cartilages are supposed to be about being shed, or that event has already taken place. The after treatment consists in fixing the joint in the most useful position, and keeping it steady by bandages, &c.—*Lancet, August* 24, 1850, *p.* 245.

63.—IODINE INJECTIONS IN HYDRARTHROSIS.

By M. Velpeau.

When recently dismissing two patients in whom he had successfully used iodine injections, M. Velpeau took a general review of the present state of the question of the propriety of employing them in dropsical joints, his observations forming a sort of Appendix to the celebrated Academic discussion, a few years since.

He observed, that the ill success recorded by Boyer and other surgeons, as resulting from throwing injections into joints, much alarmed practitioners; the mischief which resulted, however, really depending upon the nature of the cases which were selected and the procedure adopted. M. Velpeau appealed against the abandonment of the practice on these grounds. For fifteen years he had employed iodine as an injection in hydrocele, without any dangerous inflammation being excited, so that he was encouraged to extend its application to various serous cysts; and in his 'Operative Medicine,' published in 1839, he suggested that it might without danger be thrown into the peritoneal cavity, an opinion afterwards confirmed by its injection into congenital hydrocele and hernial sacs. It was only in 1840, however, that he ventured to inject the knee-joint in two instances, and that by accident, the tumour in the ham communicating with the cavity of the joint. The good success of these cases, and of others in which joints were purposely injected by M. Bonnet, of Lyons, led him, however, to adopt the practice in numerous other cases. At least fifty such, treated by different surgeons, are now on record, in none of which were any alarming symptoms developed. The dangerous and fatal consequences resulted in Boyer's cases, from the joint being widely laid open, and irritating fluids several times thrown in; while in the modern operation the smallest possible trocar is employed, and in the majority of cases, a single injection suffices. The pain and febrile action in some cases have been considerable, requiring for their removal, in the opinion of some surgeons, leeching and abstinence; but M. Velpeau has always found them as in the case of their appearance in hydrocele, if let alone, gradually disappear. Their occurence at all is, indeed, rare. In general, a little redness, pain, and swelling are observed after the injection, and are soon followed by slight fever. Increasing during three or four days, these symptoms then become stationary; afterwards to diminish, and to entirely disappear about the fifteenth day, together with a part, or sometimes all the tumefaction.

M. Velpeau now considers there is not more danger in injecting a joint than the tunica vaginalis, the chief fear being, indeed, that the operation may fail. Injection, in fact, succeeds best in proportion as the cavity more nearly approaches a simple serous one. Thus, in cysts of the neck, where the membrane containing the fluid is everywhere surrounded by soft tissues, the operation never fails. In the tunica vaginalis, where the testis places the serous membrane in a less favourable condition, failures are sometimes, though very rarely met with; while in the joints, in which the serous membrane is free only to a limited extent, and chiefly lies on solid or very hard parts, success is more rare. Still, as the employment of injection is not preventive of other means, is not dangerous, and scarcely more painful than a blister, we should always resort to it, when a simple collection of fluid resists ordinary treatment. As, however, such collections are usually capable of being dispersed, it is an operation not often demanded, and it should not be resorted to when the collection of fluid is dependent on caries, necrosis, &c. The fears entertained by some that anchylosis might result, are unfounded, the patient recovering the use of the part as soon as the swelling has disappeared.—*Gazette des Hopitaux.*

The French practitioners do not seem to have taken much notice of the writings of Dr. Borelli, of Turin, upon the employment of iodine injections in various affections, although he has been one of their most active advocates. In the last paper we have seen, he reiterates his opinion of their great utility, and furnishes additional cases. These consist of examples of *hydrocele* (he states, that hydrocele in boys and hydrocele of the cord in adults are always curable by simple puncture), *encysted tumours* after the evacuation of their contents, various forms of *acute* and *chronic abscess*, and *adenitis*. He objects to the use of resolvents, as being both tedious and useless. When matter is once formed, the abscess is rapidly cured by the injection. He relates, too, a case of *ranula* yielding to the employment of the injection, although simple puncture had repeatedly failed. Bouchacourt had, however, already published a similar case in the 'Bull. de Therap.' for 1843. After quoting a case of *fistula in ano* successfully treated by Van Camp at Angers, and relating one of his own, he states he has always hitherto failed in treating *fistulæ* in connection with diseased bone: but quotes cases from the veterinary practice of Professor Perocino, in which the iodine was successfully used in fistula connected with diseased cartilage.

Dr. Borelli considers his practice in treating abscesses by this means as somewhat peculiar, inasmuch as he seeks to obtain union by the first or the second intention, according to the requirements of the case. The suppurative process being well determined, and the acute inflammation of surrounding parts repressed by cataplasms, after opening the abscess in its most dependent part, and evacuating the contents as far as possible, he introduces a small syringe through the aperture, and throws in pure tincture of iodine with some force, allowing it to remain in, when the pain is not too great, about half a minute. He waits three or four days to see whether the plastic effusion into the pyogenic cavity will effect its occlusion. This, however, is seldom the case, unless the abscess is very small and the engorgement of surrounding tissues slight. The injection therefore, will require repetition every two or three days, according to the amount of reaction produced; and when this is in excess, emollient cataplasms are required. The author has never seen any ill effect, local or general following the employment of the iodine—*Omodei Annali*, Vol. CXXVIII.

The question of injecting the abdomen with iodine in *ascites* is no longer one of mere hypothesis. M. Dieulafoy resorted to it three times in the same subject, with the effect of producing a cure, and Dr. Leriche, of Lyons, has recently published two cases, in which a single injection after the complete evacuation of the fluid sufficed. M. Boinet also has recently presented a memoir to the Sociétié de Chirurgie, in which he has collected eighteen cases of ascites from various sources, wherein different substances, as gases, water, iodine, &c., have been injected. In fifteen of these success followed, and only in one did the patient die, iodine seeming to be the especially preferable substance. M. Morel, reporting upon this paper, pronounced an almost unqualified opinion in favour of the practice; but MM. Vidal, Gosselin, Robert, and others protested against drawing any such hasty conclusions from cases the history of which had been imperfectly given, and have to be confronted with others in which a fatal termination has resulted, an example of which has recently occurred in Paris.—*L'Union Medicale.—Brit. and For. Medico-Chirurg. Review. July*, 1850, *p.* 270.

64.—EXCISION OF THE KNEE-JOINT.

Under the care of Mr. Fergusson, at King's College Hospital.

[Although the result of this case has not been favourable, it is brought forwards to increase the number of facts with regard to excision of the joints, as the operation has been performed successfully three times before in this country and Ireland. The patient's health had been severely tried by several previous years of suffering; but it is impossible to calculate accurately the amount of strength likely to suffice for reaping the benefits of the excision. The patient in this case was a strong-made man, twenty-one years of age, a labourer in the country, and generally enjoying good health. Three years previous to admission, he had a fall upon the knee. Violent inflammation followed, confining him to his bed for nine months; and although by active treatment he was enabled to use his leg to some degree, yet a relapse occurred, defying all surgical treatment, and he was now recommended to submit to amputation as the only means of relief. On admission, the least motion of the limb caused intense agony in the inner side of the joint, increased at night; but, with the exception of debility, the condition of the patient seemed favourable for the operation.]

Mr. Fergusson gave it as his opinion, that the cartilages of the joint were ulcerated, and ordered the limb to be put into a gutta-percha splint. As however, no improvement took place, and the patient was anxious that active means should be employed to give him relief, Mr. Fergusson, seeing no hopes of effecting a permanent cure within a reasonable period of time, advised that, instead of amputation, excision of the articular surfaces should be resorted to, as the case seemed to him, in most respects a favourable one for this procedure.

The patient was brought into the theatre. July 20th, and placed under the influence of chloroform, when Mr. Fergusson began the operation by making an H incision in front of the joint, the transverse line running a little below the patella. The extensor tendon was then dissected upwards, and raised with the patella like a lid, by which means the articular ends entering into the formation of the joint, were brought into view. The ligaments were then divided, the soft parts detached from round the bones, one inch and three-quarters of the lower end of the femur, as well as the head of the tibia for about three-quarters of an inch, were sawn off from before backwards, and the sharp margins of the bones pared down with the forceps. Mr. Fergusson then cut out the patella from its ligamentous attachment; several vessels were secured, and the lines of incision brought together by points of suture. Water-dressing and a roller were subsequently applied round the joint, and the patient removed to bed, where the leg was kept extended with a pillow under the ham.

Mr. Fergusson remarked that the patient had experienced so much suffering and annoyance from the affection of the knee, that he had come into the hospital to undergo amputation. But Mr. Fergusson had long thought that excision of the knee-joint had not received sufficient attention in this country, and had resolved to put this method into practice when a case calculated for such an operation should present itself. He considered that it was cruel to remove a healthy leg and foot, as was seen in this instance, when means might be employed to save these parts. That the disease of the joint was sufficient to warrant surgical interference was now clear, for there was no vestige of cartilage left. The operation that had just been performed had been undertaken six times in these countries: twice at Liverpool by Mr. Park, twice in Dublin by Sir Philip Crampton, and twice also in Edinburgh by Mr. Syme. Out of these six, three had been successful, and in two of those which have been unfavourable, the failure did not immediately owe its origin to the operation itself. Mr. Fergusson, therefore, thought that we had not sufficient reason for abandoning the operation, and that the condemnation of some surgeons who had not much experience in excision of bones should not weigh against its revival; he had been anxious to bring the operation again before the profession. His mode of procedure had been exactly the same as that followed by Moreau and Sir Philip Crampton.

A little bleeding occurred in the afternoon, which was arrested by cold water and ice, and the limb was then placed into a fracture-box with hinged sides and a foot-board: a cushion being placed under the upper end of the tibia to keep it in apposition with the end of the femur, and water-dressing with the many-tailed bandage, were applied. Pulse quick and feeble. Morphia three-quarters of a grain.

On the third day after the operation the patient had severe rigors, much fever, and complained of pain in the head; the transverse incision had united by first intention, and the sutures of the internal were taken out to favour the escape of the discharge. On the fifth day the wound looked languid, and did not present any granulations: the end of the tibia might be seen in the wound, of an ash colour, and when the leg was raised the ends of the bones were heard grating against each other. The patient continued to have severe rigors, for which he was administered full doses of sulphuric ether, and the wound, the discharge from which was of a sanious character, was dressed and washed out with myrrh lotion. On the seventh day a very favourable turn took place; the rigors ceased; the countenance was less flushed and anxious; the pulse, which had been quick, feeble, and compressible, improved; the patient passed a good night, his appetite returned, and he expressed himself as feeling very comfortable. The wound looked much more healthy; granulations were springing up on both sides, and the discharge assumed a more healthy character. The only unfavourable symptom was a threatening of diarrhœa, for which decoction of logwood was prescribed. This state of things did not, however, last long. On the eighth day rigors came on again; the patient was bathed in cold perspiration; blood was found in clots beside the wound, but the hemorrhage was easily stopped by the application of ice. Delirium came on, with frequent loose and black alvine evacuations, and the patient sunk on the ninth day after the operation.

On a post-mortem examination all the viscera were found perfectly healthy; the veins were traced up to the heart and were quite sound. The periosteum of the end of the femur, could be stripped from the bone with great ease, and the bone itself was found, for the length of three inches, in a state of acute necrosis; the cancellated structure being full of pus, and the tibia for the distance of nearly two inches was in the same condition. Nothing was found in the intestines to account for the diarrhœa, excepting a small vascular patch in the colon stained with logwood.—*Lancet, August* 10, 1850, *p.* 183.

65.—FRACTURE OF THE NECK OF THE THIGH BONE.

By John Lizars, Esq., Edinburgh.

[Mr. Lizars, believing "the diagnosis of the fracture of the neck of the thigh bone is little understood even by surgeons holding important situations," mentions the following cases as reasons for his belief. He says:]

In the majority of cases the diagnosis is simple:—The shortening of the limb, the eversion of the toes, *the flattening of the nates*, and the pain at the joint, especially when the thigh bone is rotated, at once indicate the nature of the accident, which generally occurs after fifty years of age. But in a very considerable number of individuals, there is no shortening of the limb, for one or more days, nay weeks, or even months, after the occurrence of the accident; and, in such cases, when the fracture has been overlooked or neglected, the shortening becomes so great, that inversion, instead of eversion of the foot and toes, takes place, and the ignorant and inexperienced surgeon pronounces the case to be dislocation of the head of the thigh bone on the dorsum of the os ilium, and the unfortunate sufferer is tortured with lacs and pulleys.

The first deceptive case of this description which I witnessed occurred many years ago, under the care of the late John Bell. The case made a strong impression on my mind, in consequence of having had soon afterwards an opportunity of ascertaining the precise nature of the injury by a *post-mortem* examination. The preparation I deposited in my museum, and it illustrates fracture of the neck of the thigh bone within the fibrinous capsule, without union. Since that time, I have seen several patients under similar disfiguration of the limb, consequent on fracture of the neck of the thigh bone.

A well-marked case occurred within these four years. A gentleman, about forty-five years of age, while travelling, fell from a height of three or four feet, and lighted on his hip. He was seen by an intelligent surgeon an hour after the accident, who examined the hip-joint with great care, but could detect no deviation from the normal condition. The injured limb, after the most accurate measurement, was no shorter than the sound one, and when placed straight by its fellow, which could be easily done, there was no turning in of the toes.

Six weeks after the accident had occurred, the patient could sit on a sofa, and walk, with the aid of crutches, about his room; and, while doing so, he could place the injured limb alongside the other, without any shortening or inversion of the toes, and when in this position, he could raise his leg and thigh to a considerable height, with ease and freedom.

In a few days after this the limb became disfigured, when, I understand, the patient consulted an hospital surgeon, who considered the injury to be dislocation of the head of the thigh bone on the dorsum of the os ilium; and, if he really thought so, he must have tortured the ill-fated gentleman with lacs and pulleys; but for what length of time I know not.

I was consulted in this case, within a few days subsequent to the failure of the means resorted to, and, after inquiring into the history of the accident, and carefully examining the hip-joint and limb, I stated to the patient, that if his account was correct, I suspected that he had sustained fracture of the neck of the thigh bone. The appearances of the limb were as follows:—great shortening of the limb, with marked retraction of the heel, the toes crossing the sound foot over the tarsus; *flattening of the hip-joint;* extensive mobility of the limb, even through the efforts alone of the patient, and with marked abduction. Without any assistance he could perform flexion, extension, and abduction, in a free manner. and to a full extent.

A case, parallel in many respects to the last, presented itself to me about two years ago:—A lady, about fifty-five years of age, in attempting to descend from the step of the door of a first class railway carriage, fell down. When carried home, her ordinary medical attendant, a very superior surgeon, was called, and as he could see nothing commensurate with the pain and lameness, he sent for a surgeon of great reputation, attached to one of the largest hospitals in a metropolitan city. After the most careful examination they could discover no fracture, and were satisfied at the end of three months' attendance on the case, that none existed, at which period the lady set out for Edinburgh. On her arrival here I was consulted, and found unequivocal marks of fracture of the neck of the thigh bone: the limb being shorter, the toes everted, and *the hip flattened.* The reason for the toes in this case not being inverted was, I presume, that the periosteum and fibrous capsule had not been torn so as to allow such a separation of the head of the thigh bone from its shaft, as occurred in the case referred to of Mr. John Bell, and others yet to be detailed.

When I was officiating as surgeon of the infirmary in this city, my clerk or house-surgeon, Dr. William Home, one of the most talented surgeons of the day, now staff-surgeon in the army, remarked to me one day (after I had made some clinical observations to the students, respecting a man whom I had dismissed cured of fracture of the neck of the thigh bone, with little or no shortening of the limb), that he was doubtful if fracture had existed in some of the cases I had treated as such, and that he would esteem it a favour, if I would allow the next patient who came in, with supposed fracture of the neck of this bone, to lie in bed without a splint. To this proposal I assented. Not many days elapsed before a man was admitted into the hospital with injury of the hip-joint, which Dr. Home considered merely a bruise, while I pronounced it fracture of the neck of the os femoris. The man was about fifty-five years of age,—had fallen from a height of not more than 3 feet, and lighted on his hip. There was no shortening of the limb, and no eversion of the toes, but slight *flattening of the natis,*—an appearance which I consider, along with other symptoms, strongly characterises the nature of this accident. He felt little or no pain in moving the limb, and there was no crepitus. The man was laid in bed on his back without any splint, and the joint fomented. The limb was examined daily by Dr. Home and myself, and on the 8th day we perceived a slight shortening, with the heel more drawn up than the toes. Dr. Home was then convinced that fracture of the neck of this bone existed, and applied the long splint of Desault. In this patient a tolerable cure was effected.

I have met with three cases, where this fracture simulated morbus coxarius, viz., flattened natis, sinuses extending down the thigh, shortened limb, with inversion of the foot and toes. On dissection the head of the os femoris was in a state of necrosis, and far apart from the neck and trochanters. The patients were upwards of fifty years of age:—in one, the fracture was overlooked; in another, it had been mistaken for a bruise; and in the third, for dislocation on the dorsum of the os ilium; in which last, the patient had been tortured with lacs and pulleys by an hospital surgeon.

In Part VI. of my Anatomical Plates, 1st edition, p. 157 of the descriptive letter-press, I pointed out to the Profession, that fracture of the neck of the thigh bone is liable to be mistaken for dislocation of the head of the os femoris on the dorsum of the os ilium. I remarked, that "the powerful extensors drag the trochanter major upon the dorsum of the os ilium, and the gluteus medius pulls it forward, or to the pubic region, until the limb assumes the same appearance, as in luxation on the dorsum of the os ilium."

In my work on Practical Surgery, 2nd edition, p. 128, I state, "the neck of the thigh bone is often fractured, and in many there is no alteration of the limb until some days after the accident, and if neglected, the toes become ultimately inverted."

I am of opinion, that in all cases of injury of the hip-joint, if there is *flattening of the natis*, and especially if the individual be upwards of forty years of age, we ought to look for fracture of the neck of the thigh bone, and apply Desault's long wooden splint, and retain it for six or eight weeks, if the skin over the sacrum remains sound, and the health of the patient will bear it. I deposited in my museum a preparation of ossific union within the fibrous capsule, which occurred in a man upwards of sixty years of age, and I am confident that I have succeeded in uniting this fracture in several patients. But, however strong and neat the junction may be, still the length of the limb will be reduced to a trifling degree; the shortening proceeding unavoidably from insterstitial absorption, and in consequence of the angle being changed between the shaft and neck of the bone, from the obtuse to the right, or even the acute angle.—*Med. Times, July* 6, 1850, *p.* 8.

66.—CASE OF UNUNITED FRACTURE OF THE TIBIA, OF TWENTY-FOUR YEARS' STANDING, SUCCESSFULLY TREATED.

By R. W. Tamplin, Esq., Surgeon to the Royal Orthopædic Hospital.

[Miss —, æt. 25, slipped, at the age of 14 months, between the bars of a garden-seat. A little discolouration followed at the lower third of the leg, and a slight curvature of the bone. On the child walking less strongly, a surgeon was consulted, who consoled the parents, "that all would be well in a few months." Another surgeon being called in, discovered the fracture, and pronounced it "falsely united." The case under treatment now appeared to be progressing satisfactorily, when the child happened another accident, and the smaller bone of the leg is stated to have been broken. All means which were tried to procure union of the fracture completely failed, and the general health became greatly impaired. The case was then pronounced incurable, and amputation was the general advice given to the patient. Although an instrument was contrived by which she managed to get about, yet it was not without great pain, the weakness increasing in spite of the artificial support.]

On the 17th of July, 1849, I first saw the patient, and, upon examination, found that the leg had been fractured at the lower third obliquely upwards, the upper portion of the tibia projecting pointedly forwards and riding over the lower third. The leg was two inches and a half shorter than the other. It was freely moveable. The knee, from the constant irregular strain upon the ligaments, yielded outwardly, and the patient could not put the leg to the ground, even with the assistance of the support, without suffering severe pain both at the point of fracture and in the knee-joint. Her general health had suffered more or less, and her existence is stated to have been a burthen to her.

From the history of the case,—the fact that it had existed from childhood, that all attempts had failed, that amputation was the general advice given,—I gave a doubtful opinion, but determined to make an attempt to obtain a union without operation. Three indications occurred to me: first, to bring the bones in apposition; the second to obtain absorption of the false uniting medium; the third, to endeavour to obtain union, either by the deposition of bony matter, which I thought might possibly be thrown out from the irritation which must necessarily be set up, or by a contraction of the portion of the false union which immediately surrounded the fracture. With these views I ordered an instrument to be so made that the thigh could be firmly grasped above the condyles of the femur, the foot below having a screw by means of which the distance between the knee and foot could be gradually increased. This instrument was applied on the 31st of July, 1849, and the leg kept horizontal, in the extended position. Gradual extension was now commenced, and continued for four days. So much pain was occasioned in the gastrocnemius, that I found it necessary to divide the tendo-achillis, which was done in the usual manner by puncture from within outwards. The instrument was omitted for eight days, and then re-applied, and extension again used. From this time the leg became gradually and easily elongated; and during the extension a steady continued pressure was kept up on the tibia above the point of fracture, and counter-pressure at the back of the leg, just above the ankle-joint. This treatment was persevered in unremittingly until the 9th of January, 1850, without interruption to the health; there was, however, at times severe pain, which was allayed by opiates, when, upon examination, the leg was found to be of equal length with its fellow, and the bone retained its position unassisted. I then applied the common splints, and ordered an instrument, with a boot attached, to support the weakened knee-joint, which had resumed its proper relative position during the treatment, and also having a pad to support the tibia, in case the union was imperfect.

On the 26th of February, the patient could raise the leg in the horizontal position without the slightest pain, and without a sign of motion at the point of fracture. I then applied the new support, which was worn, without any attempt to put the foot to the ground, until the 8th of March. She was able to stand on the 3rd of April; and then, at the request of Mr. Travers, and afterwards in the presence of Mr. Lawrence, both of whom kindly visited the patient, she walked without pain, and without a sign of motion at the point of fracture. Since that time she has continued to use the leg freely, with slight intermissions from indisposition. Can walk up and down stairs. Her general health has improved, and I have every reason to believe that a perfect cure has been effected.—*Med. Gazette, July* 26, 1850, *p.* 140.

67.—FRACTURES OF THE RIBS.

Reported by Dr. Charles Kidd, Guy's Hospital.

[Fractures of the ribs are now treated in this hospital regularly by long strips of plaster being applied over one side of the chest. The first case illustrating this mode of treatment, was in that of Thomas Browne, who happened an accident by being precipitated off a plank on the edge of his coal barge. He complained, on admission, of the ordinary symptoms, with intense pain in the side, increased on inspiration, and the fifth, sixth, and seventh ribs were found broken.]

The side was strapped by passing large strips of adhesive plaster round the top of the chest, down over the site of the injury to about midway between the last rib and crest of the ilium; he was ordered a mixture, with hyoscyamus and tartrate of antimony, and strict rest (not a word to be spoken) enjoined. This circumstance Mr. Hilton dwells on as essentially necessary in these cases;—indeed, with absolute quiet, the strapping carefully managed, and the tartrate of antimony sedulously attended to—especially if perspiration break out—the rapidity with which these cases do well is quite wonderful.

29th.—The patient to-day is much the same; symptoms not much relieved. Ordered to continue the antimony and hyosciamus, and to go on exactly as before.

June 1st to 7th.—Went through all the familiar changes of this accident, and was so well on the 7th as to discontinue his medicines; in fact, he is quite well to-day.

10th.—Chest strapped again to-day. Left the hospital.

Thus, in, we may say, twelve days from the accident, this man leaves the hospital. It would be expecting too much, however, to think that perfect bony union had been established. The ribs, it need scarcely be said, are very vascular; the reparative power proportionally active; the man, therefore, having been cautioned what to do was discharged. He is now perfectly well, and perfect bony union all but completed.

Case. 2.—M. A. H. This case is more serious. The woman was in the habit of drinking; and in a domestic feud was beaten by her husband with a poker. On applying at the hospital she appeared in a most miserable state; very sick, with pain in the side; cough and usual signs of fractured ribs. On examination, the fifth, sixth, and seventh ribs, as in the previous case, were all found broken, with very extensive emphysema all up the side. The strips of plaster were carried from behind forward, over the chest as before, the mixture, with tartrate of antimony and hyosciamus also exhibited systematically, and strict rest enjoined.

26th.—Feels much better to day: quite different, in fact, since the plaster was put on.

27th.—Still improving; emphysema manifestly disappearing; pulse 84.

28th.—Same report.

29th.—Left the hospital to day, quite another person.

Case 3.— — Lewis, aged 47, is a case of fractured rib with laceration of the lung, bringing on pneumonia. This man, standing with a crowd at Epsom, at the races, was precipitated a distance of sixteen feet to the ground. On being taken up he was found to have broken the eighth and ninth ribs; crepitation of the two ends of the bone was quite apparent, as well as the other signs of fracture. He was put under treatment much in the same manner as in the the two former cases; straps of plaster, 2½ inches broad, were put round the chest, and antimony ordered.

13th.—He was hot and very feverish; restless. To continue the antimony.

14th.—Worse to day. Evident symptoms of pneumonia; pain in chest; rusty-colored sputa. He was ordered calomel, in addition to his other medicines.

16th.—The report of the last two days more unfavourable. He is exceedingly ill to day; quite delirious. The calomel had opened the bowels; his voice is whispering and weak; expectoration still rust-coloured; pulse 90; evidently in great danger.

19th.—Better; pneumonia subdued.

24th.—So much improved as to sit up. Was ordered to day cascarilla and tinct. cinchonæ, with additional nourishment.

June 13th.—Has been improving steadily up to this date. Straps renewed over the chest, and he left hospital.—*Medical Times, July* 6, 1850, *p*. 11.

68.—A NEW SWINGING APPARATUS FOR THE TREATMENT OF FRACTURE OF THE LEG.

By S. Jas. A. Salter, Esq., M. B., late House-Surgeon to King's College Hospital, &c.

(Read before the King's College Medical Society.)

[Mr. Salter brings this subject before the profession, because he believes it has some important advantages over those apparatus already in use, and because the plan of swinging broken legs in their treatment is attended by great benefit and immense comfort to the patient. He says:]

In the various swings I am about to mention, other attempts have been made besides swinging the leg, and allowing the limb, as well as the body, a certain amount of motion. Various splints and extensive apparatus have formed essential parts of some of these combinations; and their elaborateness and complication have, in some cases, reached a most marvellous extent.

These are the different apparatus I have been able to discover in the various works I have consulted:—

I. *Prael's apparatus.*—The only principle attempted in this device is that of swinging. The apparatus is a horizontal beam attached to the ceiling, from which the leg is suspended by cords, which pass through pulleys at the extremities of the beam. There is no particular splint belonging to this arrangement. It was first published in 1801.

II. *Schmidt's apparatus* is like Prael's, with the addition of a fracture-box, supplying the place of splints. At the extremities of the fracture-box are some straps and screws, by which prolonged extension of the limb can be effected. This was first described by Schmidt in Loder's 'Journal für de Chirurgie,' 1805.

III. *Hecker's apparatus.*—Hecker's apparatus consists of an arched iron bar extending transversely across the bed over the patient's legs; from the centre of this arch depend four chains, which are attached to a fracture-box in which the leg is placed. There are two smaller arches of iron attached to the extremities of the fracture-box and arching over the foot and knee, which serve the purpose of an ordinary cradle to keep off the bed-clothes. The bed-clothes cover over the whole of this apparatus, in this respect differing from those previously described. The fracture-box is furnished with an extension arrangement similar to Schmidt's. This apparatus was described and figured in Grafe's 'Journal der Chirurgie' in 1823.

IV. *Nusbaumer's apparatus.*—This is simply a modification of Prael's, in which the inventor endeavoured to accomplish an alternate lateral posture, as well as the swing. It is a very complicated impracticable affair. First described in 1825.

V. *Dornsbluth's apparatus.*—This differs from Prael's no further than this, that the horizontal beam, from which the leg is suspended, is connected to the ceiling by an elastic coil of wire, instead of an inelastic cord, as in Prael's. The coil of wire is stiff and elastic, one end is attached to the ceiling and the other to the centre of the beam, and it is enclosed in a box for protection. Published in 1829.

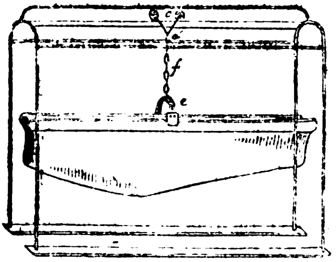
VI. *Mr. Grantham's apparatus* is a contrivance consisting of a rest in form not unlike a Macintyre's splint, having a thigh-piece, a leg-piece, and a foot-piece. On this the leg is placed (after splints have been applied) and strapped on. It is then swung by two ropes, one passing under the rest at the ham, and the other under the ankle. These ropes are attached to "anything which may be contrived at the top of a bed or over a couch." Published 1833.

VII. *Mr. Luke's plan* consists "merely of a leg-rest, two splints, and a cradle." The "leg-rest may be made either of wood or sheet-iron, the upper surface of which is hollow and roughly shaped to the form of the back of the leg. The rest is of sufficient length to reach from the foot to about five inches above the knee on the posterior surface of the thigh, and so fitted to the ham, as to afford support to the extremities both of the tibia and femur. The two (side) splints and the cradle being similar to those in ordinary use, need not any description. In applying the apparatus to its proper use, the leg-rest and splints being sufficiently padded, the fractured limb is adjusted on the former and secured by the latter, placed one on each side, and fastened by tapes carried around the whole in the usual way. This being accomplished, the rest, &c., is suspended by means of two other tapes, passed under it and over the middle bar of the cradle, now put in a convenient position over the limb. One should be placed near the ankle-joint, and the other a little below the knee." This is a simple and efficacious plan, and one very easily applied. It was first described in 1841.

VIII. *Torbock's apparatus.*—This device consists of a very strong iron vertical rod, which is fixed to the side of the bed by a clamp screw; this screw is capable of being elongated by rack-work, which is worked by a key. From the summit of this vertical rod a horizontal one stretches across the bed, attached by one end to the vertical rod, and free at the other. The horizontal rod rotates upon the vertical, so that its attached end is the centre of a circle of which *it* is a *radius*, and the line described by the movement of its free end an *arc.* Its form is like that of a sign post of a country inn. The horizontal beam is a polished rail, upon which two wheels run (adding thus a second motion to the apparatus,) and these are connected to a crib below, in which the leg is placed, similar to the one used in my apparatus. The crib is underneath the bed-clothes, and the iron-frame work external, so that they are connected by an intervening portion, the motions of which are almost wholly prevented by the contact of the bed-clothes.

IX. I now have to ask your attention while I give you a detailed account of my own apparatus, (of which a diagram is given on the next page.) It consists of a cradle, similar in form, but rather larger than the one ordinarily used for fractures of the leg; and it performs the office both of a protecting cradle and of a swing, thus far resembling Mr. Luke's but no farther.

There are two iron arches, connected by six horizontal rods; the rods connecting the extremities of the arches are flat and heavy, so as to make the cradle rest firmly upon the bed. The lower of the two rods connecting the summits of the arches, is a rail of polished steel, on which run the wheels (*c*) that are placed on it, all pressure of the bed-clothes on these wheels being prevented by the rod which extends over the rail. The *train* consists of two brass



wheels, and from the axes of these, iron plates extend down on each side to a swivel hook (*d*) underneath the rail. This train readily moves up and down the rail. From the hook hangs a chain (*f*), consisting of several links, and attached below to the summit of an arched piece of iron—the *span* (*e*). The span is a narrow strip of iron bent in a semi-circular form, having at the extremities two buttons on each side, by which it is attached to the remaining portion of the apparatus—the *crib*. The crib is composed of two flat laths of mahogany, from which hangs a sort of bag of jean for the reception of the broken rib; attached to the strips of wood are two little plates of brass, perforated so as to admit the buttons at the extremities of the span, and by this means the sides of the crib are kept sufficiently near, and also kept sufficiently apart to form a convenient receptacle for the leg.

Now, nothing can be simpler or easier than the application, removal, or readjustment of this apparatus. It is not meant as a substitute for splints, but after the application of splints the limb is placed upon the expanded crib, which is laid out on the bed underneath it, the sides of the crib are then brought up and buttoned on to the extremities of the span; the cradle now being placed over the leg, the span, and with it the leg, is raised, and its hook inserted into one of the links of the chain, that link being chosen the height of which best suits the patient. The adjustment of this contrivance is the work of a moment. It is a matter of indifference what splint is used, for the swinging is quite independent of the setting up of the leg, and adjustment of splints, and is superadded to it. A single or double side-splint, with a foot-piece, may be employed; or, what I prefer, the lower part of a Macintyre's splint, with the thigh-piece, extension screw and foot-rest removed. This receives the leg and foot very comfortably and firmly, and they may be bandaged up in the ordinary way, and independent of the swinging apparatus, which is applied afterwards.

The mechanical advantages, which it was my object to gain by the apparatus I have now described, are partly common to other forms, and partly peculiar to itself, and are principally these:—Complete protection from the bed-clothes, so that they shall not interfere with the motions of the leg. In all the other apparatus I have mentioned, excepting Luke's and Hecker's, one extremity of the cord, by which the limb is swung, is external to the bed-clothes while the other is within. The effect is, that in passing into the bed almost all motion is prevented by the entanglement of the blankets and the arrangements which are necessary to keep the clothes from pressing on the foot and leg, so that the object of the contrivance is pretty nearly neutralized thereby. I may enumerate the facility of application and simplicity, and the graduation in height of suspension, as advantages which my apparatus possesses.

The running of the train upon the rail which supports the leg, allows a very considerable amount of motion without disturbing the relation of the parts; the leg may be moved *en masse* eighteen inches without altering the relative height of the heel or knee, so that the patient may completely alter his position in bed without disturbing the adjustment of the leg.

From this circumstance, when the leg is thus swung, the patient can sit up in bed to take his meals, or to read or write; and I must here observe, that when an invalid sits up in bed, that act does not consist in merely assuming the sitting posture—in bending the trunk upon the thighs—but he always instinctively, as it were, draws himself up towards the head of the bed a foot or so, so as to rest his loins against the pillow and bolster, from which he receives no small amount of support. This you may easily see for yourselves, by telling the next patient you visit to sit up in bed; you will see how he involuntarily draws himself up, and rests his back against the pillow, so as to place his buttocks where his shoulders were previously, when he was lying down just below the pillow. Now the motion of the train upon the rail, and with it the crib and leg, just allows this posture to be assumed at pleasure by the patient. In the other swings placed under the bed-clothes (Hecker's and Luke's), this is prevented, and the amount of movement very limited, from the fact that the upper attachment of the suspending cord or chain is fixed, and the only motion that the limb enjoys is the swinging in a small arc of a circle, of which the suspending cord is a radius, and its upper attachment the centre.

From the action of the swivel hook the patient gets another movement—he can shift his body from one side of the bed to the other, while the foot moves in the opposite direction, the leg moving in the same plane upon the axis of the swivel. I cannot understand that this movement is allowed in Mr. Luke's arrangement, at least to any appreciable extent, as the tapes by which the leg is swung are at both extremities of the leg, and would seem to me to counteract such a motion; whereas if the tape were single, and attached to the centre of the leg, the twisting of this tape would be equivalent to the rotation of the swivel.

I need scarcely point out to you the great advantages which arise from any apparatus or arrangement which allows a patient, confined to bed, some change of posture—some relief or change of pressure from those parts of the body on which he rests when lying down. Any one who has seen the most moderate amount of hospital practice, must have observed the distressing consequences which are entailed upon those patients who, through a protracted illness, are confined to bed in one posture, without any change of position. The accumulation of filth and moisture under the patient, the inconvenience and difficulty with which he passes his evacuations, the obstacles to changing his bed linen, and, above all, the horrid bed-sores are to be attributed to this circumstance. Bed-sores are pre-eminently the destruction of the bed-ridden, and result from protracted pressure upon some unrelieved projecting spot—the sacrum, the hips, the scapulæ; and whether it results from paralysis, where the patient does not feel pain in the part pressed upon, and therefore does not care to move his position, or where, from loss of motor power, he cannot change posture if he did feel it; or whether it results from the patient being tied down to his bed by a fixed immovable splint, the result is the same—the skin of his back becomes gangrenous from pressure, a slough comes away, and an unmanageable sore is left, only to be enlarged by the still existing cause. How common is it for a patient who has to pass through the tedious weeks or months which are required to cure a *compound fracture* of the leg, especially if his case be complicated, as too often happens, with *necrosis*, *exfoliation*, *abscess*, or even *erysipelas*—his leg being fixed all the while in an immovable splint—to sustain bed-sores; but, swing his leg, put him in circumstances where he can sit up when he likes, or lie down when he likes, so that he can pass his evacuations with cleanliness, and be kept dry, and relieve the pressure on any particular spot, and then you will find the cause of the bed-sores removed.—*Provin. Med. and Surg. Journal*, *Oct.* 16, 1850, *p.* 564.

69.—NEW PROCESS FOR THE REDUCTION OF THE JAW.

By M. Nélaton.

According to M. Nélaton, the obstacle to reduction existing neither in the resistance offered to the condyle by the eminence of the transverse apophysis, nor in the muscular action, it must be sought for not in the articulation itself, but in neighbouring parts.

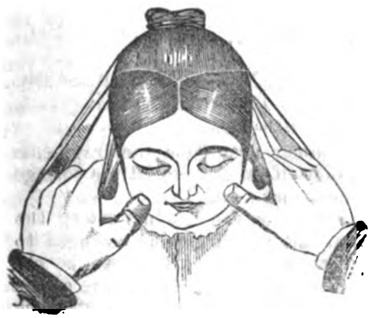
"In front of the tempero-maxillary articulation," says M. Nélaton, "we find the tempero-zygomatic fossa, in which the coronoid process is lodged when the mouth is closed. Before and behind this excavation are placed two eminences, the posterior formed by the transverse root of the zygoma, the anterior by the articulation of the superior maxillary with the molar bone. At the inferior part of the suture which results from the union of these two bones, there exists a tubercle sufficiently prominent, limited within by a notch formed by the smooth edge of the malar process of the superior maxillary bone, and often on the outer side by a little, elongated, almost oval fossette. This eminence, to which we may give the name of malar tubercle, is situated at about the distance of a centimetre from the coronoid process. In place of this tubercle we have sometimes met a plane surface, and even in certain subjects a notch more or less deep; but the presence of the tubercle is the rule. With regard to the coronoid process this latter presents great differences; very short in some, and elevated scarcely to the level of the condyle, it is found very much elongated in others; sometimes directed upwards, at other times obliquely outwards, so that its summit tends to meet the zygomatic arch; in some instances directed forwards, and distant from the condyle; in others directed backwards, so as to approach it." "These facts well established," continues M. Nélaton, "let us examine the pathological condition. Having, as I have said, undertaken some experiments on the dead body, with a view to verify the prevailing doctrine on luxations of the lower jaw, I have ascertained:—First, as M. Malgaigne observes, that if the condyle of the lower jaw is carried forwards without passing the point which the cavity of the capsule permits it to reach, the displacement disappears forcibly as soon as we approximate the dental arches, the eminence of the transverse apophysis presenting no obstacle to the return of the condyle. Second, that if the anterior part of the capsule be cut or torn, so that the condyle can pass out of it and advance a few millimetres, we remark that the displacement is permanent, not, as is generally believed, because of the elevation of the transverse root, nor by reason of the contraction or tension of the muscles, but because the summit of the coronoid process comes to butt (*arc-bouter*) against the inferior and anterior angle of the malar bone, and is lodged in the little fossette which we have said exists often at this point. The contact of the summit of the coronoid process with the malar bone appears to us, then, to constitute an indispensable condition in the true dislocation; and for this the displacement need not be extreme; it suffices that the condyle be advanced from three to four millimetres. The external lateral ligament remains intact, the capsule alone is torn at its anterior part, and the inter-articular cartilage either accompanies the condyle in its displacement, or remains beneath the transverse root, according as the rupture is either above or below its anterior edge. It results from what precedes that it is not on the condyle that we must fix attention to find the cause which renders the dislocation permanent, but on the coronoid process and the malar bone, since it is in the contact of these two bones that almost all the difficulty of reduction resides."

The following case presents a remarkable contrast between the method of reduction generally adopted, and that of M. Nélaton:

"A woman luxated both condyles of the lower jaw, whilst yawning, about 11 o'clock in the evening. M. Beaugrand, summoned on the instant, had made many attempts at reduction without success. Two other surgeons having been called in, tried several methods, and finally, at 2 o'clock at night, the patient being wearied out, was left with the luxation unreduced. On the next day the efforts at reduction were renewed, but equally without success, and on the day following (thirty-six hours after the accident) M. Nélaton was summoned. On his arrival, the patient was suffering much, the cheeks and mouth being swollen and œdematous from the pressure exercised in the attempts at reduction; and even the mucous membrane of the mouth was excoriated. The mouth was open, the dental arches separated only to the extent of a centimetre; the lower incisor teeth on a plane anterior to the upper. There was an invincible obstacle to approaching the jaws; but it was possible to open the mouth further, and the separation of the incisor teeth could be carried as far as two centimetres."

The depression in front of the meatus auditorius was well marked. M. Nélaton proceeded to examine the patient; the index finger of the right hand was introduced into the mouth, and placed on the anterior edge of the coronoid process, so that the palmar aspect of the finger, in following it up, came to the summit of the coronoid, which was then manifestly found resting in front of the malar bone. "All these points established," says M. Nélaton, I proceeded to the reduction, for which I ordered the patient to open the mouth as much as possible, and whilst she executed this movement, I placed my two thumbs on the coronoid processes and without even embracing the jaw, without taking any other point of support, a simple pressure in a backward direction caused the condyles to return suddenly into their cavities; the reduction was complete, and all the symptoms disappeared. What theory had made us only presume was surpassed by reality, and the new process was found not only to equal but superior to the old, even when put in execution by skilful surgeons." Two other cases of successful application of this process are recorded by M. Nélaton. In one, reduction had been unsuccessfully attempted by pushing the coronoid process upwards and backwards, thus approximating more closely this process to the malar bone. The patient was brought to M. Nélaton, who, placing himself behind, took with his thumbs a point of support on the nape of the neck, and commanding the patient to open his mouth, exerted a slight pressure, upon the coronoid processes, by means of the fingers placed externally; a slight noise was heard; and the condyles resumed their places, the countenance of the patient recovering its normal configuration, and the mouth its functions. It is but right to add, that M. Chevalier, interne of the hospital of St. Louis, and M. Vassor, who had seen M. Nélaton operate, failed in the application of his process, though they took the precaution of causing the patient to open his mouth; reduction was finally effected in this case by the ordinary method.

To succeed, according to the process of M. Nélaton, it is necessary to act either by the interior of the mouth, taking a point of support behind the mastoid processes, or externally, by the operator taking a position behind the patient, and making pressure on the coronoid process, pushing it downwards and backwards, to disengage it from contact with the malar bone, at the same time that the patient opens the mouth. In ordinary cases a light pressure is sufficient; but if more force be requisite, M. Nélaton advises the head to be supported by an assistant, or a band to be passed around it, in which the operator can engage his index and middle fingers, while the thumb must be brought to bear on the coronoid process. The accompanying figure exhibits a simple and efficacious method of employing a handkerchief to give a sufficient fulcrum.



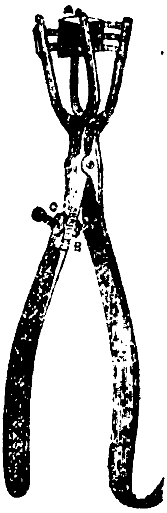
The method of reduction which we have now described has been before the profession for more than a year.—*Dublin Quarterly Journal of Med. Science*, *Aug.*, 1850, *p.* 109.

70.—REDUCTION OF DISLOCATED THUMB.

By M. Blandin.

The accompanying figure represents an instrument devised by M. Luer for the reduction of dislocation of the thumb. It has been successfully employed by M. Blandin. That originally invented by M. Luer has undergone some modification and improvement in the hands of M. Charriere, whose name is so well known in connexion with the manufacture of surgical apparatus.

The modified instrument of M. Charriere consists, as shown by the wood cut, of a forceps, the blades of which, instead of being simply enlarged, are bifurcated. The parallel arms resulting from this bifurcation of each blade are furnished with straps of leather, A, interlacing in two-thirds of their extent, and thus forming a double knot, which is opened by the separation of the blades which form the handle. The action and power of this double



knot can be limited and maintained by two screws, B, C, in such a manner that, without employing much force, a sufficiently great pressure can be exerted, which, at will, may be increased, diminished, or kept fixed. This forceps, the application of which is obvious, may be employed indifferently for all the fingers, and, indeed, on a larger scale, might be capable of more general application. With some slight modification of the handles, and the addition of rings, or other means of attaching the cords of a system of pulleys, it would be of great service in the reduction of dislocations of the limbs. The original instrument of M. Luer, though used with success by M. Blandin in the first case, completely failed in the next. It is, however, but just to add that the ordinary means of reduction had also been ineffectual, though aided by subcutaneous section of the lateral ligaments, and the attachments of the muscles of the thenar eminence. It is only, then, in recent cases that we may expect success from the employment of the instrument, which, it will be at once confessed, presents many advantages over the ordinary means, especially the rude though ingenious application of the door key, or the well-known clove hitch.—*Dublin Quarterly Jour. of Med. Science, August,* 1850, p. 117.

ORGANS OF CIRCULATION.

II.—ON THE EMPLOYMENT OF FORCED FLEXION FOR ARRESTING HEMORRHAGE IN WOUNDS OF THE PALMAR ARCH.

By E. Durwell, Esq., Guebwiller (Haut Rhin).

[Mr. Durwell, in a case of wound of the palmar arch from the fragments of a broken bottle piercing the palm, found himself, on arriving at the cottage of the patient, with no means of securing the artery; and,]

While controlling the hemorrhage by pressure on the brachial artery, the following sentence in M. Malgaigne's 'Anatomie Chirurgicale' occurred to his mind:—"The only points at which obliteration of an artery can be obtained by position alone, without the aid of external compression, are at the bend of the arm and knee—a fact which is of great importance in reference to the arrest of hemorrhage." Acting upon this statement, Mr. Durwell immediately bent the arm on the forearm at an acute angle; the hemorrhage was instantly arrested. Advantage was taken of the circumstance to effect a definite cure. The arm was retained in its flexed position by bandages, so that the pulsation of the radial artery was completely intercepted. The wound of the hand was treated as an ordinary wound, and for the sake of precaution, compresses were laid over the course of the arteries of the forearm. The cure progressed favourably. On the third day, as the patient complained of the posture, the arm was slightly extended, and it was noticed that a small portion of florid thin blood oozed from the wound. The arm was restored to its flexed position, and in a short time the vessels and the external wound had perfectly healed.

In this manner a wound, usually regarded as of a very serious character, was safely and speedily cured by a proceeding as simple and unobjectionable as has ever been proposed. It must be attended with success when employed in analogous cases, and, from its simplicity, should be tried in the first instance in every case. Mr. Durwell observes justly, that it would be rash to make a more general application of a single fact, as there may doubtless occur complications, rendering its employment impossible or unadvisable; but, at the same time he adds that this principle may be found, by further experiment, to be useful on other occasions, for the obliteration of the popliteal and humeral arteries. This principle he lays down in the proposition—"that in most arterial lesions of the forearm and leg, prolonged forcible flexion supersedes the ligature of the vessels."—*L'Union Medicale.*

[We find that the pulsation at the wrist is entirely stopped by firm flexure of the arm at the elbow-joint: hence hemorrhage from the ulnar and radial arteries may be thus controlled.—ED. MED. GAZETTE.]—*Medical Gazette, Aug.* 23, 1850, *p.* 351.

72.—ON THE ORIGIN OF THE EPIGASTRIC AND OBTURATOR ARTERIES BY A COMMON TRUNK FROM THE INTERNAL ILIAC; WITH AN INQUIRY INTO THE AMOUNT OF DANGER OCCASIONED BY VARIOUS POSITIONS OF ARTERIES IN THE ORDINARY OPERATIONS FOR FEMORAL AND INGUINAL HERNIA.

By Dr. P. REDFERN, King's College, Aberdeen.

[We are sorry we cannot find more room for Dr. Redfern's learned treatise on this subject. The conclusions arrived at by this excellent physician, after his elaborate investigation of this subject, are,]

1st, In every possible variety of inguinal rupture, the stricture ought to be divided directly upwards, as by so doing there is not the slightest risk of hemorrhage.

2d, The probability of the occurrence of hemorrhage is much greater in operations for femoral than for inguinal hernia, as the epigastric, obturator, or internal circumflex artery may be divided in exposing the sac; and the obturator, epigastric, or a large anastomosing branch, may be injured in the division of the stricture.

3d, The varieties in the arteries named are sufficiently frequent to render them of great surgical importance, and that variety is most important in which the vessel is displaced inwards, by the descent of a femoral hernia, and becomes tensely stretched over the front and inner side of the neck of the sac.

4th, The risk of hemorrhage is not lessened by dividing the stricture of a femoral hernia in any other direction than inwards, or upwards and inwards, but it is very much diminished by dividing as few of the tense fibres of the edge of the ring as possible,—by avoiding a sawing motion,—and by pressing the edge of the knife rather upon the anterior surface than directly on the edge of the fibres constituting the stricture.

5th, In a male, whose testis has passed into the scrotum, the spermatic artery may be wounded, and the testicle lost, by dividing the stricture at the neck of the sac of a femoral hernia upwards, and, therefore, this method of operating ought to be relinquished.—*Monthly Journal of Med. Science, September*, 1850, *p.* 222.

ALIMENTARY CANAL.

73.—CASE OF MALIGNANT DISEASE OF THE TONGUE.

IN WHICH THE LINGUAL GUSTATORY NERVE WAS DIVIDED.

By JOHN HILTON, Esq., F. R. S, &c.

[This was a case of a female aged 39, admitted into Guy's Hospital, Feb. 26, 1850, having a large, excavated, ragged ulcer, with hard, raised, inverted, irregular edges, occupying the left side of the tongue, and of considerable extent. The patient suffered much from severe pain within the head, and from a profuse flow of tenacious saliva, with an inability to take solid food, from the pain produced in the ulcer thereby. Near the os hyoides was a gland deep in the neck, somewhat enlarged. Her pulse was about 80 in a minute. Internal viscera healthy. After observing the effects of actual cautery to the projecting and painful edges of the ulcer, and the administration of conium internally, Mr. Hilton decided on removing the tumour by excision. In consequence, however, of the greatly swollen, inflamed, and painful state of the tongue, the operation was deferred. Sixteen leeches, and a hemlock poultice were applied to the neck: pieces of ice were kept in the mouth, and ext. conii, gr. v., were ordered to be taken every six hours, and aperients occasionally.—Under this treatment the swelling soon subsided. The ulcer improved in appearance, but did not diminish in size.]

The disease of the tongue was progressing; the ulcer too sensitive to permit food to be taken; the salivation distressing; and she had great pain over nearly the whole of the distribution of the fifth nerve on the left side. Believing that many of these symptoms might be relieved if the sensibility of the ulcer could be destroyed, and knowing that the destruction of the sensibility of the tongue would render the operation of sloughing off the diseased parts by the application of ligatures nearly painless, I determined, if possible, to divide the lingual gustatory branch of the fifth nerve between the disease and the brain.

20th.—I placed the patient in the recumbent position, but with the head a little raised, opposite a good light. My dresser, Mr. Morgan, drew the tongue (which was much congested with blood) forwards, upwards, and towards the patient's right side. I then divided vertically, with a small knife, the mucous membrane, and submucous tissue to about three-quarters of an inch in length, opposite the molar teeth, over the hyo-glossus muscle, and across the position of the upper margin of the sublingual gland; the progress of the operation was much impeded by the almost constant flow of blood, chiefly venous, into the wound; but, by continuing deeply by the side of the tongue, this first incision, through the upper edge of the sublingual gland, I exposed the nerve; and, laying hold of it with forceps, I divided it with scissors; immediately all sensation was lost in the anterior part of the tongue, and in the ulcer; either part could be seized and pinched with forceps without the patient being in any way aware of it. The bleeding was stopped by a piece of sponge, dipped in a strong solution of alum, being forced into the wound. After the operation the patient had a good deal of pain in the left side of the face, and in the left ear, and the soft parts in the left side of the neck became inflamed and swollen. Leeches and poppy fomentation subdued this condition in a few days. During this period the pain in the ear and face continued severe, morphia and conium were given internally. Aconitine and belladonna were applied in solution to the external auditory canal, and chloroform to the face with some relief. The day following the division of the nerve the profuse flow of saliva had ceased, and liquid and semi-solid food could be taken freely without causing pain.—Considerable portions of the ulcer were subsequently sloughed off by ligature without the slightest pain to the patient; but the swollen and infiltrated condition of the inferior part and base of the tongue, precluded the possibility of enclosing within ligatures the whole of the disease. Exactly one month from the date of the division of the nerve, she began to feel again on the left side, at the tip of the tongue. The flow of saliva became again increased, and the surface of the deep excavation in the tongue began again to be somewhat painful to the touch. After a consultation with my colleagues, and taking into consideration the depressed condition of the patient's health, the extension of the disease of the tongue beyond the median line, and the increasing size of the cervical gland, it was deemed advisable not to employ any further operative means.

[On the 7th of July, the patient died. Some slight arterial hemorrhage took place from her mouth a few days before her death. No complete post-mortem examination was allowed.]

This operation, of dividing the sensitive nerve of the tongue was adopted for the purposes alluded to in the report of the details of the case.

1st. To destroy the sensibility of the ulcer, so as to enable the patient to take food. 2d. To reduce the flow of saliva, which was excessively distressing. 3d. In the hope that the pain she experienced over the distribution of the fifth nerve might be immediately relieved. And 4th. To deprive the operation of sloughing off the diseased portion of the tongue by ligature void of pain.

The first and second of these intentions were accomplished by the operation; the third was only in part accomplished, and, I suspect, from the divided nerve (exposed in the wound made in the operation) being irritated or inflamed by the contact of the saliva, mixed with the secretion from the ulcer. The fourth was also in part accomplished, and, I believe, might have been entirely so, had not the supervention of local inflammation in the adjoining structure retarded the intended operation by ligature, and so allowed the disease to progress to such an extent, as to preclude any attempt at its complete removal.

Experience alone can determine the question as to whether the division or excision of a piece of the sensitive nerve of the tongue may be justifiable in cases of painful ulcers on that organ, when not remediable or relieved by other means: but when a large portion of the tongue is to be removed by ligature, I would earnestly suggest the previous division of the lingual gustatory nerve, so as to deprive that method of removal (by ligature) of its greatest objection, viz., the suffering to the patient, which is necessarily associated with it when the nerve is entire.

The case here detailed is interesting in reference to the short period of time, one month only, required for the reunion of the divided nerve to become so far established, that the patient could feel, indistinctly, mechanical impression made upon the previously insensible left side of the tongue.

By referring to Mr. Rose's report, it will be seen that, on June 21st, two months after quitting Guy's, the patient states, "For the last month, sensation has been gradually returning more and more," so that we may presume the nerve had not become completely united before that time, about two months from the period of its division.—*Guy's Hospital Reports*, Vol. VII., *p.* 254.

74.—HARE-LIP IN FRANCE.

It is, perhaps, not generally known in this country, that French surgeons are in the habit of operating upon children for this deformity a few days after birth. The justly celebrated Paul Dubois is a great advocate for this practice, which, it is contended, is extremely advantageous, as children at that early period, do not struggle: union is obtained very rapidly, and the little creatures cry but little, take the breast well, and do not seem to suffer much. M. Guersant, surgeon to the children's hospital, stated the other day, before the surgical society of Paris, that out of seven children operated upon almost immediately after birth, he failed only once; whilst out of the same number of children one month old, he failed five times. He attributes this disproportion to the fact, that newly-born children can do without the breast during four days; (?) they thereby are not apt to tear open the sutures by efforts at suction.—*Lancet, June* 8, 1850, *p.* 694.

75.—EXCISION OF ENLARGED TONSILS.

By Prof. Syme, Edinburgh.

[Mr. Syme remarks that childhood is the age most exposed to this morbid condition, though it not unfrequently makes its appearance during adolescence, and is sometimes met with at a considerably more advanced period of life. The only source of speedy and effectual relief is local treatment, for which the means that at different times have been of use are escharotics, ligature and excision. After making some remarks on the antiquity of each of these, Mr. Syme says,]

In the year 1821, during my residence in the Royal Infirmary of Edinburgh, as house surgeon, one of the female patients suffered from enlargement of a tonsil. After trying sulphate of copper, and similar applications, without success, I attempted the ligature, but without being able to accomplish it, and then as the tumour was of no great size resolved to remove it by excision, which was accordingly done very readily by means of a hook and curved scissors. This, so far as I know, was the first instance of a tonsil being cut out in Edinburgh. Next year I went to Paris, and there found M. Lisfranc in his course of operative surgery on the dead body, treating excision of the tonsil as an established operation. He employed for the purpose a straight narrow blunt-pointed bistoury, of which the blade was sheathed, except for rather more than an inch from the point, and explained that if the tumour was pulled inwards from the side of the fauces or merely held steady in its natural position, the knife might be carried with perfect safety through its base, as the blade must then be parallel with the carotid artery, and at such a distance from it as to render any injury of the vessel quite impossible.

Much impressed with the advantages of the operation as thus performed, I endeavoured, on my return home, to promote its adoption, and having carried with me the forceps of Muzeux, placed them in the hands of Mr. Liston, who also ever afterwards did all in his power, by precept as well as example, to establish the practice. The counties of Perth, Stirling, Peebles, and Roxburgh, are very prolific of enlarged tonsils, and the success attending their removal by excision soon brought patients from all parts of the country, on both sides of the Tweed. Abundant opportunity has consequently been afforded for determining the merits of the operation on the sure ground of extensive and long continued experience.

In no instance has hemorrhage or any other unpleasant accident occurred. The texture concerned possesses so little sensibility that the excision is accomplished with hardly any pain; and children, who are sometimes induced with difficulty to submit, in the first instance seldom offer any objection to removal of the second tonsil. I never employ a speculum of any sort,—even in the youngest and most obstreperous patients,—the forceps sufficiently keeping down the tongue, and the wide opening of the mouth preparatory to the emission of a cry, affording ample space for the knife to act. In the whole course of my practice, I have only on two occasions failed in accomplishing the object in view, through the excessive size of the tongue and contraction of the mouth. The knife should possess a very keen edge, as the glandular substance is sometimes indurated, and a partial division of it would lead to great embarrassment, from the blood trickling into the pharynx, and causing such cough or convulsive efforts as must render a fresh seizure of the tonsil next to impossible.

I generally remove the left tumour first, and then the right one, by crossing my hands so as still to retain the knife in the right. The process is instantaneous, and the relief immediate. The bleeding seldom exceeds a teaspoonful or two, and no after treatment is required.—*Monthly Journal of Med. Science, Sept.*, 1850, *p.* 225.

76.—INSTRUMENT FOR ARRESTING EPISTAXIS.

By M. Gariel.

[This is a tube made of caoutchouc, carrying at its extremity a dilatable balloon, which, when introduced into the nostrils in its undistended state, may, by the process of insufflation, be made to assume such dimensions, and exerting such pressure as completely to arrest the hemorrhage.]

A simple method of plugging the posterior nares suggests itself in examining this tube with dilatable extremity. This operation as at present performed, whether with a special apparatus or with an ordinary catheter, is frequently very troublesome, though simple in appearance. If the tube be introduced from before backwards through the cavities of the nose, until it has quite cleared the posterior nares and arrived in the pharynx, and be then dilated and drawn forwards, we obtain a more complete and manageable plug than that usually made of lint.—*Dublin Quarterly Journal of Med. Science, August*, 1850, *p.* 129.

77.—STRICTURE OF THE RECTUM.

Reported by Dr. Charles Kidd.

[This was a case of stricture of the rectum which was divided by Mr. Simon, at St. Thomas's Hospital. The main features of the case were as follows:—Eliza L., æt. 30, married, had been under the care of Mr. Simon for disease of the rectum for two years, attended by stricture. Having suffered from syphilis extensively, the conclusion arrived at was that it might have arisen from inflammation of a syphilitic origin and not malignant. After describing the symptoms consequent on the affection, and her appearance as presenting all the marks of great emaciation and suffering, Dr. Kidd proceeds to say:]

"As usual in bad cases, the hemorrhoidal veins have become engorged, and the cellular tissue about the lower end of the gut also extensively diseased; so that, together with piles, some of her recent symptoms would indicate the existence also of fistulæ. On examination before the operation, the stricture was felt very distinctly, impermeable to the end of the little finger, and very high up,—a point of corroborative interest, in the diagnosis, *non*-malignant stricture being generally so situated, even as high as the sigmoid flexure, where it joins the rectum; the reverse, perhaps generally obtaining in carcinoma, which is situated among the glands about the anus. The diagnosis, I need scarcely observe, of the nature of the disease in this case, required a great deal of care. Mr. Simon's long acquaintance with its history, however, left no doubt on his mind of its non-malignant character.

All the usual palliative treatment having failed out of hospital, Mr. Simon, on Saturday, advised the operation. The length of time, indeed, the system seems to bear up against this disease, is not the least of its peculiarities. Once it breaks down, it is a *facilis descensus* indeed; the patient gets worn out and emaciated,—purulent matter, of a scalding nature, comes constantly away,—the pulse gets small and intermittent,—the stricture perhaps ulcerates,—and the wretched patient is worn out. To avoid all this, the certain result of not operating, she was induced to make up her mind. Though her face exhibited much nervous anxiety and suffering, her general health had not, perhaps, given way.

Having been placed under the influence of chloroform, she was prepared for the operation. Placed on her face, the stricture was soon reached, the mere point of the finger getting into it, and giving rise to much mucous discharge, evidently high up; a grooved director was passed up to it, together with a bistoury. The director was next let fall out, and the knife carried through all the parts up to the coccyx. The operation is obviously of great extent; the lower part of the rectum being destitute of peritoneum, makes it, perhaps, less serious than it otherwise would be. The intestine above the point of stricture seemed quite free. The rectum was laid open, the muscular tunic, on division, resembling not a little the structure of the œsophagus. Two vessels, possibly branches of the superior hemorrhoidal, spouted out pretty freely, and were tied; the fibres of the upper and lower sphincter were also visible. The thick mucous membrane with the stricture; the various veins and nerves were all divided.

After the hemorrhage had ceased, a large plug of lint was put into the wound, and secured by a T bandage. The chloroform began to lose its effect, and she was removed to bed.

The operation differs, only perhaps in extent, from that for fistula in ano; it is of interest, as differing from Amussat's operation for stricture of the rectum, which consists in cutting into the cavity of the intestine from above, and making an artificial anus in the groin,—a remedy little to be preferred to the disease. It is of interest, also, as exhibiting the resources of art in a disease not malignant, and when all other means seemed of no avail.

Much care is necessary, of course, in distinguishing stricture of the rectum. An enlarged or displaced uterus, or, in man, an enlarged prostate may give rise to all the symptoms of this disease; sarcomatous tumours, not unfrequent in the rectum, should also be borne in mind; together with the long catalogue of malignant tumours to which this part of the system is specially liable, the latter form by far the largest proportion of diseases of the lower bowel, attended with stricture.

The whole length of the rectum, I may add, may be diseased, or two particular and distant points. We may have mucous and purulent discharges from the suppuration of piles, spasmodic contraction of the sphincter, and strangulation of piles; in all these the mode of operation will be different. Need I say, how many cases are aggravated by neglect; the mucous, cellular, and muscular coats all extensively diseased, the disease creeping steadily on, some other part of the system apparently engaged; many people dying of different intestinal affections, as they think, the disease, after death, found in the rectum.

As a case essentially of a practical character, indeed, I think the present one is worthy of our attention. After the operation, Mr. Simon ordered a large dose of opium, to allow the parts to rest. Since then the woman has been doing well, and no abdominal pain whatever.

The following day the plug was taken out—there appeared to have been no hemorrhage.

26th.—Going on well, the bowels acting comfortably.—*Medical Times, July* 27, 1850, *p*. 89.

78.—FUNGOUS TUMOUR OF THE RECTUM IN CHILDREN, ATTENDED WITH BLOODY DISCHARGES.

By M. Leclayse.

M. Martin has already directed attention to the affection as it occurs in the adult producing discharges which are mistaken for those from hemorrhoids. The first case occurred in a child, æt. 5, about whom the author was consulted in consequence of hemorrhages which occurred during a prolapsus ani, and which arose from an excrescence that he at first mistook for hemorrhoids. Examining it more closely, he found it was a spongy vegetation, not unlike a portion of the placenta, which protruded from beyond the sphincter when the child went to stool, and was quite insensible to the touch. As the hemorrhage had been considerable, the fungus was touched with the nitrate of silver, whenever it protruded; and, owing to its softness, four or five applications, at intervals of several hours, sufficed for its destruction. In a second case, a girl, æt. 8, had become much reduced by the quantity of blood she had lost during several weeks; and a fungous tumour, about the size of an almond, was easily removed in the same way. A third case occurred in an infant six months old, in whom efforts at stool protruded a tumour the size of a pea, which bled. The author believing it to be the germ of the fungous tumour, also treated it with caustic.

M. Leclayse believes that this affection is often mistaken for hemorrhoids; and especially when the bleedings are said to be due to internal piles. The caustic could not be applied very high up, but as the bleeding has only occurred on the protrusion of the tumour, this has been easily reached, the application being successful even when the base of the tumour could not be attained. —*Rev. Med.-Chirurg.—Brit. and For. Med.-Chirurg. Review, October*, 1850, *p*. 552.

79.—OPERATION FOR PROLAPSUS ANI.

By Professor J. F. Dieffenbach.

[M. Dieffenbach followed four distinct methods according to the nature of the case. The preliminary treatment in all consisting in a dose of castor oil the day before, and an enema of warm water immediately preceding the operation. The patient is bent forward over a table, the nates being separated by an assistant.]

1. *Diminution of the anal opening by excision of folds around it.*—After returning the rectum, one of the cutaneous folds which surround the anus like radii is seized by a pair of sharp-hooked forceps half an inch from the opening; and the fold is then cut away close within the opening by a pair of straight, sharp-pointed scissors. Four, five, or even more strips are successively removed in the same manner, so that the anus is surrounded by a wreath of bleeding rays. The more lax the skin, the broader must be the strips removed. The wounds must be at equal distances from each other, for when two are close together, the small intervening portion of skin is easily destroyed by suppuration, and one wound results, which is so large, that the subsequent cicatrix and stretching of the skin are injurious. Cold water dressing is then employed. In slight cases where the prolapsus only consists of one or two folds of mucous membrane which can easily be replaced, this plan is to be adopted, and it is generally successful. In more severe cases it is either useless, or but of temporary utility.

2. *Excision of wedge-shaped pieces from the anus* is recommended when this part is greatly weakened, but not entirely paralysed, and when the prolapsus consists of large, fresh, unaltered, folds of mucous membrane, which only project during the act of defecation. When the projection is only on one side, but one wedge is excised; when it is on both sides, or when it forms a sort of ring, a wedge must be removed from each side. The prolapsus is returned; a sharp hook is passed within the anus as far as the edge of the part returned, and carried through the membranes and first fibres of the internal sphincter ani; the hook is drawn a little outwards, and the wedge cut away with a small scalpel. When the prolapsus is not great, the wedge may be small; but in more severe cases, Dieffenbach has often excised two wedges, an inch wide on each side. The edges of the wounds are immediately brought together by strong sutures, and cold-water dressing used. The result is most satisfactory, the cure complete, and relapse never occurred in Dieffenbach's practice.

3. *Excision of parts of the anal ring and of the callous prolapsus* is indicated when the opening is very much widened, the prolapsus old and large, the folds of mucous membrane dense, firm, and hard, or loose and spongy, with large permeating veins, the patient having suffered from continual hemorrhage. The operations upon old and hard, or soft and spongy prolapsus differ, but in both the part must be protruded at the time of operating. In the first class of cases, the projecting fold is seized by a pair of forceps, and a strong suture passed through its base: the ends are kept on opposite sides, while the fold is removed by a pair of scissors, in a semicircular direction around the anus; the ends are then brought together, and serve the purpose of fixing and drawing forwards the edge of the wound, while fine sutures are passed to unite them. This is all that is necessary in cases where the anal opening is not very large. When it is so, a wedge must be excised from it, in the manner described in the preceding paragraph, the two wounds forming together a T. In very severe cases, it is dangerous to do too much at once, and it is far better to complete the operation after two or three intervals. The convolutions having been removed, and the wound healed, after a month or so, when the patient is quite well, the wedge may be excised.

4. *Extirpation of the spongy prolapsus*, which consists of the convolutions of the loose sanguineous mucous membrane of the rectum, is performed in the manner just described, when the prolapsus is partial, and the anal opening narrow. When it is total, and large, the operation is first performed on one side—that of the greatest protrusion—in a different manner. The part is seized by a pair of curved forceps, resembling those called entropium forceps, and the convolution is then cut away by scissors, close to the edge of the forceps. The edges of the wound are immediately closed by fine sutures, as severe hemorrhage often comes on. The part removed includes the centre of the prolapsus, and extends at one end to the skin surrounding the anus, and at the other to the mucous membrane of the rectum. The rectum is cleaned by injections of cold water, the patient kept in bed, and cold applications used. An opiate is given to prevent defecation during the first day. Sometimes this alone effects a cure; in other cases it is necessary to repeat the operation on the opposite side, after the patient has quite recovered from the effects of the first. Dieffenbach relates some remarkable cases in which patients who had been extremely reduced by continual bleeding and suffering, were thus restored to perfect health.

5. *Cauterization.*—When the external and internal sphincters of the anus are paralysed, the anal opening is often so large, that a doubled fist can easily be passed through it, and the intestine can only be kept within it by some mechanical contrivance. Removal of parts of the prolapsed intestine would be useless in such cases, as fresh protrusion would continually take place. Excision of parts of the borders of the opening also proves useless, as the cicatrices soon become soft and yielding. The actual cautery, however, suffices to effect a cure, acting partly upon the nerves, and partly by the formation of contracting cicatrices. The anus being protected by the introduction of a ball of charpie, a cauterizing iron, of the size of a large walnut, is applied upon the skin surrounding the anus, and repeatedly carried slowly around the opening,

so that an eschar is formed, an inch or an inch and a half in width, and the skin appears as if burnt to leather. The iron must be carried close to the line of connexion between the skin and mucous membrane. The charpie is removed from the anus, a smaller quantity introduced, and a wad of cotton-wool laid upon the eschar. The patient is placed in bed, and an opiate given. Cotton-wool is applied until separation of the eschar at the edges commences. Stimulating poultices are then used. After complete separation, the suppurating surface is dressed simply, and castor oil given. When cicatrization is complete, the patient is perfectly cured. Dieffenbach has found the opening so much narrowed, that bougies had to be used for some weeks; but this is rare, and the general result is most gratifying, both to surgeon and patient.—*Brit. and For. Med. Chirurg. Review, October*, 1850, *p.* 295.

80.—LINSEED OIL IN HEMORRHOIDS.

By M. Van Ryn.

M. Van Ryn believes, that, in general, surgical treatment is too hastily resorted to in this affection, and he wishes to bring under the notice of the profession a remedy he has found of great efficacy during twenty-five years. It consists in the administration of two ounces of fresh linseed oil morning and evening; and so rapid is the amendment generally, that the remedy is seldom continued longer than a week. Sometimes the stools are somewhat increased in quantity, but neither vomiting nor any other ill effect is produced. The only precaution the while, is the abstinence from alcoholic drinks, and too stimulating a diet.—*L'Union Medicale.—Brit. and For. Med.-Chirurg. Review. October*, 1850, *p.* 553

URINARY ORGANS.

81.—THREE CASES OF PERINEAL SECTION.

Under the care of Mr. Cock, at Guy's Hospital.

Mr. Syme's method of perineal section for the cure of stricture being here put into practice, it is hoped these cases will be of great interest and value. The first is the case of a waterman, aged forty years old, who, at the age of fifteen, contracted gonorrhœa, and who, for the whole of the interval, from this period to that of his admission, was the victim of catheterism, either by regular or irregular practitioners; so that, at the time of admission, the urethra could only be kept permeable by a frequent introduction of the bougie, accompanied by much pain and suffering, occlusion of the canal rapidly taking place if it was abandoned for a short time.]

Under these circumstances of constant misery, the poor man expressed himself desirous of submitting to any operation which would afford him the chance of permanent relief; and Mr. Cock considered that the only means available in his peculiar case, consisted in dividing the diseased and contracted portion of the canal, thereby allowing the urine to pass for a time through the opening in the perineum, and giving an opportunity for the urethra to regain a healthy state. If the latter condition had not been accomplished, it was Mr. Cock's intention to maintain a permanent opening in the perineum, below the seat of mischief, the moderate inconvenience of which would have been a preferable alternative to the distress which the patient constantly endured. The latter, however, was a man of most irritable and nervous temperament, and although the operation was undertaken at his own request, he looked forward to it with the greatest anxiety and apprehension,

On March 20th, after the patient had been placed under the influence of chloroform, Mr. Cock introduced a small grooved staff into his bladder, and divided about two inches of the urethra, including the bulbous, and a part of the membranous portions of that canal. An elastic catheter was introduced, and the patient was taken to bed in a singularly depressed condition.

The loss of several ounces of blood a few hours after the operation increased the prostration, from which he never rallied. The next day his irritability became extreme, and he could not bear the presence of the catheter. He complained of general pain of his body and extremities, difficulty of breathing, rigors, and intense restlessness. The various symptoms which characterise phlebitis soon came on, and although all available means were adopted to combat the disease, he continued to get worse. On the afternoon of the 25th, his arms suddenly became swollen and tense, apparently from general interstitial effusion, accompanied by severe pain. He now sank rapidly, and died in the night, five days after the performance of the operation.

The *post-mortem examination* was conducted by Mr. Birkett, who furnished the following account:—The cuticle was separated from the cutis along the fore-arms, and underneath was serum; these parts were much discoloured, but the left-arm was most affected. Both lungs were infiltrated with serum, but no acute inflammation existed. The heart was normal, as also the alimentary canal; the liver congested, soft, and mottled. Both kidneys were congested and coarse, the two structures very indistinctly marked, and the tunics adherent. The pelvis of the left kidney was very much injected, purulent fluid was expressible, and in the left organ some parts were rather soft. The bladder was not very large, nor were its walls thick; the mucous membrane was, however, much ecchymosed in isolated patches. The edges of the incision through the perineum were sloughy, and all the veins forming the left prostatic plexus, were more or less filled with coagula, in some parts adherent to the lining membrane of the vessels, but no pus was detected. Some of the veins constituting the right plexus were likewise inflamed; no traces of peritonitis were discovered. Though this patient was very irritable and nervous, it should be borne in mind, that at the time of his death phlebitis reigned with great violence in the hospital.

The second case runs as follows:—William G——, an excavator, aged thirty-seven, was admitted into Stephen ward, April 3d, 1850, under the care of Mr. Cock. Has had stricture twelve years, which he attributes to previous attacks of gonorrhœa. The complaint appears to have been much aggravated by several severe courses of catheterism, each of which left him worse than he was before. Three years ago, he was under M. Ricord, at Paris. His urinary difficulties have continued to increase up to the present time, and he is now suffering from all the symptoms of confirmed stricture. On examination, the obstruction was found to be situated near the root of the penis, anterior to the scrotum; the callosity surrounding the stricture could be distinctly felt from the exterior, and the canal just allowed the passage of a probe.

Mr. Cock, on the 10th of April, divided the stricture, including about an inch of the urethra, on a grooved probe; No. 6, elastic catheter was then passed into the bladder, and retained two days, when it produced prostatic irritation, which was subsequently followed by an attack of testitis. Nos. 7 and 8 catheter were afterwards occasionally passed, and the urine continued to ooze from the wound during micturition for nearly three weeks, when the aperture finally closed. The patient left the hospital May 18th, forty-five days after admission, quite well, and able to pass his water in a good stream, which he had not done for many years.

We now proceed to give the third case. Thomas T——, a labourer, forty-four years of age, was admitted into Philip ward, April 9th, 1850, under the care of Mr. Cock. The patient has been married twenty-four years, has suffered eighteen from stricture, and ascribes his affliction to a previous gonorrhœa. He has had retention of urine many times, and has undergone various severe courses of catheterism. During the last four years, the patient has come occasionally under Mr. Cock's observation. A considerable portion of the urethra appeared to have been preternaturally contracted, but the principal obstruction was a few inches down that canal. On several occasions, a certain amount of dilatation has been effected with perfect but temporary relief to his symptoms, a relapse having always followed the cessation of the means employed. Much injury has frequently been done by the injudicious use of instruments.

On examination after his admission, an almost total occlusion of the canal presented itself about four inches down, just at the junction of the penis with the scrotum; and the induration surrounding the stricture was readily felt from the exterior. The obstruction was only permeable to a fine probe, after which the smallest-sized bougie followed, and readily found its way into the bladder.

On April 17th, Mr. Cook divided the stricture, including about an inch and a half of the urethra, on a grooved probe, after which, a small-sized elastic catheter was guided through the more deeply seated obstructions into the bladder, and retained three days. Larger catheters were successively passed at intervals until the canal had become sufficiently dilated. The wound suppurated freely, and remained patulous and gaping, so as to afford a free view of an instrument as it lay in the passage. Thirty-five days after the operation the incision was all but healed, merely allowing the escape of a drop or two of urine during micturition. The patient passed his water in a perfectly good stream, and a No. 7 catheter could be readily introduced into the bladder. All his former symptoms of distress, intolerance, &c., gradually disappeared, and he was discharged May 28th, 1850, with complete closure of the wound, in a very favourable condition of health, and passing his urine without any difficulty."—*Lancet, June* 29, 1850, *p.* 775.

82.—CASE OF STRICTURE OF THE URETHRA, INVOLVING THE GREATER PORTION OF THE CANAL—COMPLICATED WITH STONE—PERINEAL SECTION—SUBSEQUENT TREATMENT OF STRICTURE BY INTERNAL INCISION.

Under the care of W. Fergusson, Esq., reported by H. Smith, Esq.

[As there has been lately so much discussion as to the merits of certain measures adopted for the cure of stricture, the following complicated and difficult case cannot be read without interest.]

As far back as the beginning of April, the patient, who is a young sickly-looking man, about twenty-five years of age, was admitted into the hospital under the care of Mr. Fergusson. He was in a condition which was much to be pitied. His urine was coming from his bladder in three different directions; rather, it was passed by three separate outlets. Only a few drops came away by the urethra whenever he attempted to urinate. The greater portion was evacuated through two artificial openings, one in the perineum, the other in the abdominal wall, on the left side above the ilium. And from the latter it was emitted on voluntary exertion, in a complete jet, as from a fountain. A stricture commenced between two and three inches from the meatus, and apparently, from the thickening of the parts, extending all along the spongy urethra to the bulb.

The patient was miserably weak and hectic, and in constant suffering from the irritability of his bladder, which caused him to rise every hour or two in the night. Besides the opening in the abdominal wall before mentioned, a large scar was observable just above the pubes. The explanation of all this will be found in the history of this case, which is as follows:—Two years since he fell from the rigging of a vessel, and came across a spar upon his perineum. Great pain was caused immediately after the accident, but in a few hours it ceased; some slight swelling, however, soon came on. Nevertheless he continued at his work, for a month afterwards, at the end of which period an attack of retention of urine took place and continued for ninety-eight hours, when a surgeon relieved him by *puncturing the bladder above the pubes.* A canula was kept in the wound for six months after this, and during the whole time the patient only passed a few drops of urine by his urethra. Soon after the operation some leeches were applied to the belly, and two of the bites, one on each side, degenerated into fistulous openings, which allowed urine to pass through; that on the right side eventually closed up, but the one on the left has continued open ever since. At the time the bladder was punctured, *an incision was made through the perineum,* (rather into the perineum,) but nothing but pus was let out. Six months after, the water came away by this opening as well, and has been passing ever since. In such a state, then, as has been described, he was sent to Mr. Fergusson. This gentleman very carefully examined the urethra, and found that the smallest instrument was stopped about two and a half inches from the metus, and that with great care it was impossible to get into the bladder through the natural passage, without using force. It was very evident that the first thing to be done was, to get a free passage for the urine, the retention of which, and the constant irritation caused by its trickling through the three outlets, were telling so much upon the man's health. Mr. Fergusson therefore determined, after allowing some interval for the patient to recruit his health, to open up the perineum freely, and pass an instrument into the bladder. Consequently, on Saturday, April 20, the man was brought into the theatre; placed in the position for lithotomy, and a free incision was made through the perineum, down upon the urethra. A short gum catheter was then with case introduced by this wound into the urethra, and from thence to the bladder. Whilst Mr. Fergusson was doing this, he wound out a new and unexpected complication: he felt the instrument strike against a hard substance; suitable instruments were obtained, and the foreign body was removed: it was found to be a calculus, about the size of a nut. It appeared to have been formed in a sort of pouch, not in the bladder, but in front of its neck. A free opening thus having been made for the urine to escape, the patient was sent up to his ward.

For some days after this proceeding, the patient went on very well. The urine came freely away through the wound in the perineum. No instrument, however, could be passed through the urethra. At the end of a week he was somewhat suddenly attacked with unfavourable symptoms; he vomited; his skin became jaundiced, and he complained of great pain in the abdomen, more particularly over the seat of the liver; and on examination, this organ was found to extend beyond its normal limits, and it was evident that the cause of his symptoms existed in an affection of this viscus. Some anxiety was entertained respecting the result of this attack, for upwards of a fortnight, as the patient became excessively depressed, and was unable to take much nourishment. By great care, however, the symptoms were removed, the inflammatory attack subsided, and there was so much improvement, that on May 10th, Mr. Fergusson thought fit to begin to treat the stricture again. He endeavoured very patiently to introduce a small catheter, but he could make no impression, and, as there was considerable induration along the urethra outside, he applied the potassa fusa, at the point of a wax bougie, to the face of the stricture. The patient was enabled to take his nourishment well, which is chiefly fluid, beef-tea, wine, &c.

May 25th.—This man has improved to such a degree that he is enabled to sit up; and, although his general health is still weak, he is much better than he was. The benefit which accrued to him from the operation of opening the perineum is evidenced by the state of his bladder; there is much less irritability now that there is a free discharge for the urine. This opening has been kept patent by the introduction, from time to time, of an elastic catheter. Mr. Fergusson has not yet been able to get any instrument through the urethra; although he has repeated the potassa fusa two or three times, the only benefit which appears to have arisen from the caustic, is a partial removal of the induration outside the urethra.

May 29.—As there appeared no possibility of getting an instrument through the strictured portion of the urethra by ordinary means, Mr. Fergusson passed an instrument down to the stricture, and divided it pretty freely from within. This instrument is Mr. Fergusson's own invention; it consists of a grooved director, with a handle to it, and a long narrow knife with the cutting edge at its very extremity. The blade is so narrow, and the groove in the director is so deep, that the cutting edge of the knife does not come into contact with the healthy part of the canal, but can be made to freely incise the strictured portion. Two days after this operation, a No. 2 catheter was passed right into the bladder with comparative ease.

June 6th.—Matters are going on satisfactorily. The opening in the abdominal wall has closed up; and although he cannot pass his water by the urethra in a stream, it dribbles away quickly. Mr. Fergusson was enabled yesterday to pass No. 6 catheter. His health is still unsatisfactory; his appetite remaining bad.

13th.—There has been so much improvement during the last week, that this young man has been able to go out and take a walk in the yard of the hospital. The opening in the perineum is not closed, and it allows the urine to come away through it pretty freely yet. Mr. Fergusson passed to-day a gum catheter through this into the bladder, and a No. 4 silver instrument through the urethra.

27th.—Mr. Fergusson has found some difficulty, during the last few days, in introducing a No. 5 catheter through the stricture; it appears to have contracted somewhat again. He has passed both No. 4 and No. 5 to-day; but it is evident that recontraction of the divided stricture is taking place already; and it is Mr. Fergusson's intention to have the patient placed under chloroform, and then to divide the strictured portion much more freely from within than he had done before; and subsequently to introduce a gum catheter, and retain it for some time. The patient has been enabled to go out and take a trip down the river in a steam-boat.

July 6th.—Mr. Fergusson freely divided the stricture with the urethrotome, and passed No. 8 catheter, and allowed it to remain in the bladder.

9th.—No. 10 elastic catheter was passed, and ordered to be kept in. The patient suffers very little from the presence of the instrument.

16th.—The catheter has been retained with the production of scarcely any irritation; and, when Mr. Fergusson saw the patient to-day, it was quite loose in the urethra. This, therefore, was taken out, and as large a one as the urethra could with facility admit was introduced, and is to be kept in. The opening in the perineum is not entirely closed up. The general health of the patient is still weakly. He feels that the necessary confinement to his bed is a drawback to him.

22d.—As the patient expressed a desire to return to his home, and as the urethra was now fully dilated, he was dismissed to-day.—*Med. Times, July* 27, 1850, *p.* 90.

83.—STRICTURE IMPASSABLE TO INSTRUMENTS—COMPLICATED WITH PERINEAL FISTULA—PERINEAL SECTION.

By W. Fergusson, Esq., King's College, London.

[The patient in this case when a young man had gonorrhœa, and about seven years ago he first began to feel the symptoms of stricture. These increased, when about fifteen months ago, effusion of urine took place suddenly, and he was taken to one of the London hospitals, where incisions were made into the perineum. A fistula remained, however, from these openings, and at the end of nine months he was again admitted, as the symptoms of stricture continued to be aggravated. A decided attempt was now made to cure the stricture by dilatation, by the introduction and retention of a large-sized instrument, but it failed, and the patient some time after sought admission into King's College Hospital. The scrotum was then found immensely swollen, with some fluid. The catheter could not be passed, and there was a fistulous opening in the perineum. Incisions were made into the swelling, and a large quantity of fetid urine escaped. As no catheter could be passed, Mr. Fergusson decided upon laying open the urethra by external incision.]

On Saturday, July 6th, Mr. Fergusson performed the operation in the following manner:—The patient being put under the influence of chloroform, a catheter was passed down to the seat of stricture; a free incision was then made through the indurated tissues in the centre of the perineum down upon the urethra, and the point of the catheter was reached. The knife was now carried further along, and the whole extent of the strictured part was divided, until the surgeon was enabled to pass an instrument fairly into the bladder. There was no particular amouut of bleeding, and no more difficulty in the operation than usual. The patient was placed in bed, and a gum-elastic catheter was retained in his bladder.

8th.—This patient has not had a bad symptom since the operation, and has suffered only the ordinary amount of sympathetic fever: pulse 96, tongue clean; the catheter is producing no irritation, and the water passes freely away through it.

13th.—The catheter has been producing some amount of irritation: it was, in consequence, taken out of the bladder; but there was some little difficulty in withdrawing it, as its extremity was encrusted with phosphatic deposits. Mr. Fergusson introduced another instrument, and ordered it to be retained.

16th.—Mr. Fergusson to-day introduced a No. 12 catheter into the bladder with ease. The wound is looking well, and is granulating in a healthy manner: the patient is improving rapidly in his health; appetite is good, tongue clean, pulse good, and he is recovering fast. The catheter which was last passed could only be retained two or three days, as it produced considerable œdema of the prepuce; it was accordingly extracted, and the parts were allowed to remain perfectly quiet, and no other instrument was introduced. After this the wound rapidly healed. On the 22d no water at all was coming through the perineal opening, and he could pass it along the urethra in a full stream. Everything continued going on well with this patient: an instrument of full size was introduced along the urethra once or twice more, and he was dismissed well in the middle of August.

This case presents, in many respects, features of interest, and especially as lately there has been considerable discussion as to the line of treatment which should be adopted in certain cases of inveterate stricture which will not yield to ordinary measures. Surgeons of all ages, and of every school in this country, have recommended that those cases which will allow of their removal by dilatation alone should be treated by the catheter; and the majority of cases which we have to contend with, either in hospital or private practice, are of this nature,—that is to say, in by far the greater number of cases of stricture of the urethra, a temporary cure, at least, can be brought about by the cautious employment of dilating force. But hitherto the most experienced and careful surgeons have now and then met with such obstinate cases of stricture—cases not only obstinate, but complicated to such a degree, either in consequence of their situation or extent, that they have found it absolutely necessary to resort to stronger measures than those afforded by the use of the catheter or bougie. Thus every now and then the surgeon meets with a stricture involving the orifice of the urethra or extending some way within it. In such an instance it is almost useless to attempt a cure by dilatation alone: the readiest way is to divide the stricture by a cutting instrument, and then to apply a dilating power subsequently: by this means a cure will be rapidly brought about by an exceedingly simple operation.

Then, again, there are a class of cases which are most troublesome to treat, and which are likely to lead to the most disastrous results to the patient, if some permanent relief is not given; and they generally, if not attended to, go on to such an extent, that it is found needful to lay aside the bougie, and to employ the knife. The early history of the present patient is an instance of this. A stricture is met with, and forms about the bend of the urethra. No care is taken about it; the person indulges in his usual habits; year to year is passed in this manner; the obstruction increases in severity and extent; and, if application is made to a surgeon, in all probability no instrument can be passed through the stricture, either in consequence of its extent and hardness, or from the circumstance of the urethra being in a most irritable condition. Under such circumstances there is constant danger of the urethra giving way behind the strictured part, in consequence of the straining efforts the patient feels compelled to make. This does happen suddenly, and he is either carried off, or, by timely interference, he rallies; but a fistulous opening remains in his perineum, and, as an outlet is thus produced for the urine, some relief is obtained; the patient again goes about his occupation without attending to the disease. The continual trickling of the urine through the fistulous opening produces a chronic inflammation and thickening of the tissues of the perineum; the urethral canal becomes more and more obstructed, and at last the condition of the patient becomes so bad that he is obliged to seek relief.

In some of these cases, if there be no particular urgency of symptoms, and if the obstructed portion of the urethra is not very extensive, and there be not very great induration of the tissues of the perineum, an entrance may be obtained into the bladder by the catheter, if both surgeon and patient persevere for a sufficient period. And when this is effected, and the urethra has become fully dilated, the fistulous sinuses will close up, and all the bad symptoms resulting from the obstruction of the canal, and from the unnatural course which the urine had been taking, will disappear.

But, in some of these cases, matters have become so bad, that recourse must be had to some more powerful agent than the catheter. In consequence of ulceration having taken place behind the stricture, extravasation of urine occurs, and places the patient's life in jeopardy: if he recover from the first attack, and yet no instrument has been got into the bladder, or the case has been neglected, he is liable to its recurrence, as in the case of the patient just narrated. On two occasions this serious accident took place; and, on the last, an enormous quantity of pus and urine was evacuated by the surgeon. As the patient, therefore, had already suffered so much, and as all the evil consequences of neglected stricture had developed themselves, and, after careful attempts, it was found impossible to get an instrument into the bladder by fair and gentle catheterism, Mr. Fergusson considered it a proper case in which to perform the operation of external incision. He had had several instances in the hospital of a somewhat similar nature, when the operation had been followed by the most perfect success. The same good result fortunately took place in this instance. In a short time the urethra had become fully dilated, and the patient left the hospital entirely free from every vestige of the troublesome malady which had annoyed him for so long a time.

This case, together with one reported some time since, will probably excite some interest at this time, as there has of late been a free, and somewhat angry discussion amongst certain parties respecting the propriety of cutting strictures at all. Some eminent authorities, and one in particular (Mr. Syme of Edinburgh), have distinctly affirmed that the division of a stricture at the point of the catheter, in such a case as here narrated, is never necessary and, in fact, is an unwarrantable proceeding on the part of the surgeon. These gentlemen state that no stricture is truly impermeable, and that, with sufficient patience, a surgeon may always get a passage into the bladder. We are by no means disposed to deny this assertion; we believe that a metallic instrument may, by a sufficient amount of force, be carried through into the bladder, however firm the structure may be. There are others, again, who advise somewhat freely the external division of strictures; and it must be confessed that surgeons of the greatest eminence, from Le Dran down to the distinguished Liston, have carried this doctrine into practice in such cases as were deemed proper for such operation.

We have now had an opportunity which perhaps has not fallen to the lot of very many, of observing with accuracy and care the effects of the treatment of stricture by perineal section; and we are now fully impressed with the conviction that neither the one doctrine, that strictures ought never to be cut, nor the other, that perineal section is frequently necessary, and should be unsparingly carried into practice,—is either correct or safe to act upon. We have now seen several cases in which the patient was brought into a state of misery and danger, and the difficulties in the ordinary treatment were such, that it was found absolutely necessary to resort to the perineal section; and the operation has been followed, as we have before stated, by such excellent results, that any surgeon who would call such practice unwarrantable would either show great prejudice or want of experience. On the other hand, again, we have seen death resulting from the division of the urethra, even in cases where there has been but little difficulty in the operation; and this has happened in instances where it was by no means absolutely necessary to perform perineal section. In one case death resulted ten days after the operation which had been performed, when even a moderate-sized catheter could be passed into the bladder—an unconquerable argument against the performance of perineal incision in cases where a catheter can be previously passed into the bladder, as recommended by Mr. Syme.

As, then, it is found that death does occur after division of a stricture by external section, the surgeon is in duty bound to weigh all the circumstances of any particular case well before he puts this proceeding in force; and we are of opinion that in no instance whatever should the operation of perineal section be performed unless the most careful attempts have been previously made to introduce the catheter, or unless the patient be either in danger, or is particularly anxious to undergo it.

In such a case as we have narrated above, the surgeon is perfectly justified in attempting to make a complete cure of the disease when he finds other means fail; and it will be, for the most part, found that the greatest success after operation ensues in these very cases which present the greatest difficulty, and where the disease has been of long standing, and great disorganisation of the tissues of the perineum and scrotum has occurred; for in such cases the system has, as it were, become accustomed to the irritation which has been constantly kept up, and it will be the better able to bear an operation. But in instances where there has been disease of a milder character, or of shorter duration, the system has not yet accustomed itself to constitutional irritation; and if a serious operation, as cutting through the perineum into the urethra, be performed, it will readily take alarm, and such excitement will be produced as will be sufficient to carry the patient off. Such, at least, has been the result of our own observation, after watching nearly twenty cases in which perineal section has been performed.

We believe, then, that the safest and most humane part to take in this much discussed matter is to steer a middle course, and to act according to particular circumstances—to operate only in the worst cases, which will yield to no ordinary measures, and by no means to fly hastily to the knife when there is no actual necessity for it.

As for the proposal of Mr. Syme, to cut patients for stricture when an instrument can be already passed into the bladder, we confess it must be looked upon as a proceeding by no means justifiable, except on the urgent demand of the patient himself. We know of instances where fatal results have occurred after this proceeding, and others have been related where it was not only not attended with any good result, but where patients have been rendered worse, in consequence of the non-closure of the opening made during operation, and, of necessity, the existence of a perineal fistula. It appears that even in Edinburgh this method of treating permeable strictures has been denounced, and by a no less eminent surgeon than Prof. Lizars, whose great experience and practical knowledge give great weight to any opinion he may express on so important a matter as the one under notice.—*Med. Gazette, Nov.* 8, 1850, *p.* 816.

84.—CASES OF STRICTURE OF THE URETHRA, TREATED BY EXTERNAL INCISION.

By Dr. James Dunsmure, Surgeon to the Royal Infirmary, Edinburgh.

[These cases may be of some interest on account of the recent discussions on Mr. Syme's mode of treatment.]

The first case in which I had recourse to it was in the person of an Italian, Joseph Anthony, æt. 48, who was admitted into Ward No. 4, on the 23rd January, 1850. Upon seeing him the day subsequent to his admission,—he having come to the hospital after the hour of visit,—I found him suffering from infiltration of urine into the perineum and scrotum, both of which were much swollen, hard, and inflamed. There were several fistulous openings in the perineum, from which urine, escaped in small quantity when he attempted to micturate. Incisions were made into the scrotum, and one of some extent and depth into the perineum, with the view of opening the dilated part of the urethra behind the stricture. Pus and a considerable quantity of urine escaped at the time. The urgent symptoms produced by the infiltration, and which are so well known that I need not describe them here, gradually subsided, and the parts regained what the patient considered their normal state; —such as they had been in for many years, viz., a thickened and hardened condition of the perineum with various fistulous openings between the verge of the anus and the root of the scrotum. As the inflammatory swelling fell, I found that the hardness extended along the urethra for fully an inch anterior to the scrotum. The incision I had made upon his admission, and which was a little to the left side of the raphé, and in the direction of that for lithotomy, had greatly contracted, and assumed very much the appearance of the other fistulous apertures.

The man was well known to me, and to all those who had been in the habit of attending the hospital, as he had been a patient under Mr. Liston, and also I believe under almost every surgeon who had done duty in the Infirmary since that period. He was addicted to drinking, and had been so for many years. As already mentioned, the more urgent symptoms gradually subsided; and, after various attempts, I succeeded with some difficulty in passing No. 2 catheter through the stricture, which extended from an inch anterior to the scrotum to the middle of the membranous portion of the urethra. Dilatation was continued until No. 7 catheter was introduced. After consultation with my colleagues, and thinking that if the original stricture was divided,—and which I hoped might be anterior to the bulb,—that the remaining hardness of the urethra would subside, I determined upon the external division of that part of the urethra anterior to the bulb, and accordingly, after having administered chloroform, introduced a staff with the groove on the back, and about the same size as No. 7. An incision was then made into the perineum so as to divide the urethra upon the staff from behind forwards, anterior to the bulb, and to the extent of about an inch and a quarter. No. 7 catheter was then passed and retained in the bladder by means of tapes. This was not withdrawn for two days. It was then removed, and No. 9 passed, which was kept in for a short period. In two days more No. 10 was introduced; and, after a similar period, No. 12. The thickening and hardness anterior to, and in the middle of the scrotum became considerably less; but there was not much difference to be observed in the perineum, nearly as much urine flowing through the opening made at the time of the operation as that passed by the urethra. No. 12 was introduced every fifth day. About six weeks after the division of the urethra, the patient insisted on being dismissed, which was accordingly done, although the perineal wound, which was not yet healed, still allowed urine to pass.

The difficulty experienced in this case was from the cartilaginous state of the perineum and urethra, and so hard did the textures feel, that it was not easy to distinguish the staff from the surrounding tissues. There was considerable bleeding, but well applied pressure by means of a T bandage was sufficient to arrest it. It did not come from any one vessel, but seemed to be a general oozing from the most superficial to the deepest part of the wound. I have no doubt there was somewhat of a hemorrhagic diathesis, as Dr. Fyfe, my house surgeon, was obliged, from the continuance of the bleeding, to plug the wounds made in the scrotum on the day after the patient's admission.

In such a case as the one now narrated, it was hardly to be expected that Mr. Syme's method would succeed, and although, from the reason mentioned, a partial trial was given to it in the manner above described, yet to have performed the operation that Mr. Syme *recommends*, it would have been necessary to have divided the urethra for nearly the whole of its extent, which, of course, was out of the question. If the operation did no good, I consider it did no harm, for, although the perineal fistulæ still existed as on admission, yet, had the patient remained under treatment in the hospital, as he was urged to do, I have no doubt they would have contracted and healed under the continued use of the bougie. We can, therefore, in my opinion, draw no conclusion from this case, either for or against the operation by external incision.

The next case was that of William Tucker, æt. 44, who was admitted on the 12th March. He stated that he had laboured under stricture for seven years;—that he had applied for relief to various surgeons, and had been a patient for this disease in the Manchester Infirmary, and in two of the London hospitals;—that he was dismissed about nine months ago from one of the latter institutions after having been an inmate of it for nearly three months;—that the largest sized catheter that had been introduced was No. 7;—and that, since leaving the hospital, his symptoms had gradually become worse, and so distressing as to make him apply once more for relief. Upon examining the perineum, a fistulous opening was discovered, which had existed previous to the time he entered the London hospital. Thin purulent matter flowed from this, unmixed with urine, no urinous odour being perceptible. Upon making water the stream was exceedingly small, almost, in fact, in drops. After one or two attempts I succeeded in passing No. 2 catheter. As this was evidently a resilient stricture, and accordingly a proper case for external division, I determined to have recourse to it. No. 2 was then passed a second time, and kept in the bladder for twenty-four hours. It was then taken out, and on the following day a small staff with the groove on the back, and about the same size as No. 2, was passed into the bladder, the patient having previously been put under the influence of chloroform. An incision was then made into the perineum, and I had no difficulty in feeling the thickened part of the urethra, which seemed to be about half an inch in extent, and at the commencement of the membranous portion. Having felt for the healthy urethra behind the stricture, a small bistoury was pushed into it, and carried forwards, until the stricture was entirely cut through, which was known by the grating sensation being no longer felt as the parts were divided. The staff having been withdrawn, No. 8 catheter was passed with ease, and secured in the bladder. The patient was then sent to bed. No bleeding occurred. The catheter was allowed to remain in the bladder for three days (there being no irritation), when it was taken away, and Nos. 10 and 12 introduced; the latter was left in the urethra for about an hour, and then withdrawn. The following day urine was passed by the wound; but by the third this had ceased, and from that time all the water flowed by the natural passage. In ten days from the date of the operation the wound in the perineum had healed. No. 12 was passed for the first fortnight every five days. This instrument seemed to be the full size of the urethra, judging from the degree of pressure which it was necessary to use to make it enter the meatus. I kept this man in the hospital for fully five weeks after the wound was healed, and for more than a fortnight before his dismissal no catheter was passed, in order to ascertain, as far as possible, in that short space of time, whether any contraction had recommenced. Accordingly, on the 3rd of May, the day he left the house, No. 12 was again inserted, and with the same ease as formerly.

Like a great many hospital patients, this man has been lost sight of, and of course I know not in what condition his urethra is at present. But this at all events is certain, that, from the date of the operation he might have been dismissed from the infirmary in ten days, with the wound in the perineum healed—with the power of voiding his urine in a large stream—and with No. 12 catheter passing into his bladder with the utmost ease.

The third case is that of James Shortt, æt. 54, who was admitted on the 20th August. His stricture, he says, is of fourteen years' duration, and he has been under treatment for it in Ireland, in Dundee, and in Edinburgh; in fact he was a patient some twelve months ago in the hospital here under Dr. Maclagan. When he was admitted under Dr. Maclagan's care, the stricture was very tight, and no instrument larger than No. 1, could be passed, and that was got through only after several trials. He was in the surgical wards for a considerable period, and was ultimately sent to the medical department of the house for an attack of acute rheumatism. By this time, however, the stricture was so far overcome as to admit No. 9, and he was told, upon leaving the medical wards, to go back to Dr. Maclagan as an out-patient, and have instruments regularly passed. This he neglected to do, and his stricture gradually relapsed to its former bad condition. For a fortnight after his admission no progress was made in getting through the stricture, from his having requested and obtained permission to leave the hospital on several occasions to do duty with the local pensioners—he being an old soldier—which corps happened to be on service at the time, so that he was not a regular patient until the beginning of September. On the 5th I passed No. 2, and tied it in the bladder, but in the course of an hour or so he withdrew it; on the 7th No. 3 was passed, and retained until the 8th; and on the 9th, after chloroform was given, Mr. Syme's operation was begun in the same manner as in Tucker's case, but I found the stricture so far back in the membranous portion as to prevent me cutting from behind forwards. Accordingly, having pushed the knife into the staff anterior to the stricture, I inserted the forefinger of the left hand into the rectum, and steadied the staff by pressing upon it from the bowel upwards, while with a gentle sawing motion I divided the stricture from before backwards. The staff was then removed, and No. 7 catheter passed into the bladder, but not, I must confess, without some difficulty, from the point of the instrument getting out of the urethra and catching upon the posterior part of the incision. No hemorrhage followed the operation.

For the first twenty-four hours the patient suffered considerably from pain in the urethra, caused by the presence of the catheter—this, however, was so much relieved by camphor mixture and morphia, that next day he made very little complaint. No 7 was then removed, and Nos. 9 and 10 introduced. On the 16th No 12 was put into the bladder; and again on the 21st and 24th, by which time the wound in the perineum was healed—no urine having flowed from it since the 14th, and at this date, the 26th, he is quite well and able to leave the hospital.

The above is the result of the three cases in which I have adopted Mr. Syme's operation; and although much more difficulty was experienced in Shortt's case than in either of the other two, yet so convinced am I of the advantage gained by it in diminishing the length of time necessary for the cure, that I intend to adopt it in those cases of bad stricture which may happen to come under my care.—*Monthly Journal of Med. Science, Nov.* 1850, *p.* 398.

85.—INVETERATE STRICTURE OF THE URETHRA TREATED WITHOUT OPERATION.

Under the care of Mr. Holt, at Westminster Hospital.

[Without entering into the merits of the various methods of treatment in obstinate cases of stricture of the urethra, there can be no doubt that gradual dilatation is one of very great value. Edward G., aged 50, had suffered three attacks of gonorrhœa. Premonitory symptoms of stricture came on, which, being neglected, after committing an excess, he was attacked with retention of urine, when a No 3 catheter was passed with difficulty, but with immediate relief. On still further neglecting himself, a No. 2 was scarcely admitted; and for the twelve years previous to his admission at the hospital, the urine had passed guttatim, "continually running from him, saturating his clothes, and filling his boots."]

Upon admission, Mr. Holt desired that the bowels might be cleared with castor oil previous to the introduction of the catheter: this was attended to, and a No. 1 catheter was attempted, but it was found impossible to pass it more than half an inch from the meatus: it there entered a constricted portion, but was so firmly grasped as to defy all attempts at progression. The catheter was allowed to remain for half an hour. Three days afterwards the instrument was again introduced, but only proceeded as far as before; yet, by the most persevering efforts, at the expiration of one month, a No. 1 catheter entered the bladder, and was allowed to remain. The size of the catheters were gradually increased until a No. 8 could be passed with facility: it was then withdrawn for an hour, and re-introduced on the next day. The instrument was allowed to remain out two hours, and on the third, three hours, so that in a few days, it was only necessary to pass the same size once a day. After a further expiration it was passed every other day, and at the end of a fortnight increased to No. 9. This was shortly exchanged for No. 10, and the man now passes his urine as freely as ever; is not compelled to get up in the night, or empty the bladder more than three or four times a day. The sediment in the urine has entirely subsided, and he is rapidly gaining flesh and strength. Previous to his affection of the urethra he weighed fourteen stone six pounds, but on admission had decreased to ten stone four pounds.

Mr. Holt considers that in the treatment of this case no operative procedure would have been justifiable, the stricture being of a cartilaginous character, and extending from about half an inch from the meatus to the neck of the bladder. Mr. Holt has never had a case (although a great number come under his care) where it has been necessary to perform any other operation than the gradual introduction and increase in the size of the catheter or sound. He believes that when patience and the most gentle means are had recourse to in the treatment of stricture, no case is impassable, or will not yield to the treatment of dilatation; and that the disease will not occur any more frequently (if so frequently) as when operative procedure is employed. The most Mr. Holt considers it necessary to inculcate is the re-introduction of the catheter once or twice a year, and this is more as a precaution, and to satisfy the surgeon that the canal remains patulous.

[In the second case the patient had laboured under stricture for twenty-six years. He was fifty-two years old, and had had three attacks of gonorrhœa. Neglecting the symptoms of stricture, he delayed seeking professional assistance until complete retention had taken place. It being impossible to introduce the catheter, warm baths and opium were resorted to, with apparent relief, a little urine being passed; but the next day the urethra gave way, and infiltration of the urine into the cellular tissue of the surrounding parts took place, for which the usual treatment was adopted. Having been sent into the country for a time, he presented himself improved in health, but with two fistulous openings in the perineum, and the same impediment to the passage of the urine along the urethra.]

The same preparatory treatment was adopted in this case as in the former, and at the expiration of two days an attempt was made to introduce a No. 1 catheter. It entered the stricture but could not be passed into the bladder, and Mr. Holt was content, upon a first trial, with having brought the point of the instrument within the orifice of the stricture, the urethra being of the most irritable kind. No further interference was had recourse to until the expiration of three days, when the same instrument was again introduced with somewhat better success. Upon a third trial it passed the first obstruction, but became entangled at a second. This latter, was, however, after three weeks' perseverance (only the most gentle means being used,) overcome, and the instrument glided into the bladder. A sound, instead of a catheter, having been introduced, it was necessary that it should be withdrawn, and as it was not desirable to create too much irritation by a second passage of the instrument, no further attempt was made for three days, when after considerable difficulty a gum-elastic catheter was introduced, and secured in the usual manner.

The difficulty had principally arisen in consequence of the flexibility of the instrument employed, it not being sufficiently firm to be accurately guided along the canal. The catheter was allowed to remain two days, and having become perfectly loose, was removed, for the purpose of introducing a larger one; but in this, as happened in some other cases, the larger instrument would not pass, and sooner than create undue irritation, Mr. Holt preferred leaving the catheter out, and proceeding in the ordinary way, by gradual dilatation, beginning at the lowest number. The same sized instrument was again introduced, after a short interval; and about six weeks after the first introduction into the bladder, No 8 passed with facility. The fistulous openings are rapidly healing, the man's appearance and general health are materially improved, and he passes his urine in a good stream.

Mr. Holt, in some remarks which he made on these cases, stated, that with regard to Mr. Syme's advocacy of dividing a stricture, through which a catheter can be passed, he considered that in 999 cases out of 1000 this operation is not only unnecessary, but perfectly unjustifiable. Mr. Holt has never seen or had a case under his own care, through which he could not get an instrument; and having passed it once fully through, he could proceed, with occasional interruptions, until a sound, the natural calibre of the urethra, was easily admitted into that canal. Mr. Holt thinks that if patients and surgeons will not have the *patience* to overcome the manifold difficulties in the treatment of stricture, the latter will of course operate; but as he considers the same end may be obtained by much less objectionable means, he never would advocate an operation that must necessarily be attended with considerable danger.—Mr. Holt thinks Mr. Syme's statements quite correct, with regard to the case mentioned by that gentleman, where a catheter was retained in the bladder, until No. 8 could be passed with facility, and then withdrawn, the patient in a few days being as bad as he was before; but if Mr. Syme had gradually left off the introduction of the catheter, as Mr. Holt did in the first of the above-mentioned cases, he (Mr. Holt) would venture to assert that no such result would have taken place, but that the patient would, after three weeks or a month, have been enabled to have a larger size passed instead of recurring to his original condition.—*Lancet, August* 17, 1850, *p.* 219.

86.—RETENTION OF URINE—PUNCTURE OF THE BLADDER THROUGH THE RECTUM.

Under the care of Mr. GAY, at the Royal Free Hospital.

There are some points of practice whereon surgeons are not quite agreed, and the management of obstinate cases of retention of urine is one upon which opinions differ in a very marked degree; principally as regards the time when an artificial outlet should be made for the escape of the urine, and the portion of the urinary organs which should be punctured for that purpose. Every surgeon will, of course, endeavour by leeching, warm baths, and aperients, to obtain a natural evacuation of urine, or at least facilitate the passage of a catheter; and we had an opportunity of reporting a case under the care of Mr. Tatum of St. George's hospital, where efforts of this kind were crowned with success. (See 'The Lancet,' June 22, 1850, p. 756.) But when distension becomes dangerous, the question arises whether we should puncture either the membranous portion of the urethra behind the stricture (Sir A. Cooper,) or make a free opening in the perineum directly over the obstructed part (Liston,) or perforate the bladder through the rectum. Mr. Gay advocates the latter practice, and has lately been very successful in a case of retention of urine, of which we shall attempt to give an outline.

A labourer, forty-one years of age, was brought into the hospital on the 2d of May, labouring under very distressing symptoms of retention of urine.—The patient has been subject to stricture for many years; bougies have been passed at various periods; but the stream of urine had become very small, and occasionally degenerated into a dribble. On the night immediately preceding his admission, he found himself, after a debauch, unable to pass any urine; but as he was intoxicated, he went to bed, and slept until the morning. On awaking, the retention continued, and he was brought to the hospital.

The bladder, as may easily be imagined, was much distended, the patient tormented with a constant desire to evacuate it; the tongue thickly furred, the pulse quick, the thirst extreme, and the heat of skin very great. A brisk purgative was at once administered, leeches applied to the perineum, and the patient placed in a warm bath. Mr. Jackson, the house surgeon, then tried to pass a catheter, but could not succeed, even with the smallest size. After the bowels had been well opened, a good dose of opium was given, and bougies and elastic catheters tried again, but without effect. At one o'clock in the afternoon the bladder had become much more distended; and no prospect of immediate relief by the usual remedies being anticipated, Mr. Gay was sent for.

After examining the patient, and conferring with his colleague, Mr. Wakley, Mr. Gay determined that no time should be lost, and at once punctured the bladder from the rectum. A large quantity of urine passed, the canula was withdrawn, and the patient instantly dropped off into a sound sleep. An antimonial saline draught, with tincture of opium, was ordered to be given every four hours. In the evening the patient expressed a desire to pass his urine, and he did so, but with his ordinary amount of difficulty. He continued to evacuate his bladder at intervals during the night, and from that time his recovery was so rapid, that four days after admission, he left the hospital to resume his work, and was desired to attend, as an out-patient, to have the narrowed canal of the urethra gradually dilated.

This is a type of the majority of cases of retention of urine which apply at the hospital for relief; and Mr. Gay is strongly of opinion that similar treatment, instead of that which is too often pursued—viz., cutting down on the seat of the stricture,—would be attended almost invariably with similar success. The condition of the urethra, in cases like the preceding, is of a temporary character, and as it is brought about, with few exceptions, by excesses, it is to be remedied by those means which are calculated to reduce the inflammatory action which is generally combined with spasm. The time required for overcoming this state of urethra is, however, too long, while the bladder remains unrelieved, and the question then presents itself—Which is the simplest and least dangerous method of evacuating the urine?

Mr. Gay stated that, notwithstanding the objections which have been brought against the operation of puncturing through the rectum, he had not met, in his experience, any unfavourable results from this practice. He had operated on persons of different ages, and on one person in particular, under the most unpromising circumstances, and nevertheless, not a single bad symptom had ever followed. Mr. Gay believed that such had likewise been the fact in the practice of other surgeons. He therefore unhesitatingly recommended this method as being vastly superior to incisions into the perineum.

Should the stricture be of such an obstinate character that the relief which was obtained in the preceding case does not immediately follow, and the bladder again become distended, Mr. Gay would prefer (especially if there were the slightest prospect of effecting a passage by the use of bougies and other treatment) puncturing the bladder again and again, to cutting down on the stricture; and he is convinced that there are very few strictures, in the condition alluded to, which do not admit of cure by a well directed course of treatment and use of instruments.

The dangers attending the other modes of relieving the bladder are very great, and the fatality frightful. Such operations on individuals whose constitutions have been impaired by irregularities and excesses of all kinds (and these are the very persons who are generally subjected to this treatment) are ill borne, and should if possible be avoided. Mr. Gay believes the time will come, and that shortly, when the perineal section will be very rarely performed, and the puncture from the rectum be, so far as operations are concerned, the *rule* of practice.

In the case before us, no urine passed per rectum after the withdrawal of the canula, nor has such a circumstance occurred in any case which Mr. Gay has seen. The puncture of the trocar does not produce any loss of substance, but three valves are formed on the recto-vesical septum which close the aperture when the instrument is withdrawn.—*Lancet, July* 13, 1850, *p.* 59.

87.—NEW METHOD OF RELIEVING RETENTION OF URINE WITHOUT THE USE OF THE CATHETER.

By M. J. J. Cazenave.

[The following remarks which have appeared in 'L'Union Médicale,' are deserving of the attention of the profession.]

When called to a patient having retention, complete, or incomplete, M. Cazenave in the first place directs the large intestines to be cleared out by an enema. When this has returned a second is administered, but consisting solely of a quart of cold water. Absolute rest on the bed is enjoined; while cloths dipped in cold water, or better still, bladders of ice-cold water, or pounded ice, are applied to the anus, perineum, thighs, and hypogastrium. If the patient do not void his urine in the course of half an hour, or void it only very scantily, he is placed at the edge of the bed, which is properly guarded, and a stream of cold water is poured on the region of the bladder during from twenty to twenty-five minutes. After the lapse of this time another enema of cold water, and small smooth fragments of ice, are introduced into the rectum, the cold applications to the external parts being at the same time continued. The cases in which this mode of treatment is found applicable are those in which the retention proceeds from acute inflammation or spasm.—*Med. Gazette, Aug.* 1850, *p.* 242.

88.—CASE OF RETENTION OF URINE.

Under the care of Mr. **Tatum**, at St. George's Hospital.

Various means of relief are at the surgeon's command in cases of retention of urine; among these puncturing the bladder where no catheter can be passed must frequently be resorted to; and the nicety of the discrimination seems to consist in determining how long the attempts at passing catheters may be kept up, and how far opium and warm baths may be carried. Among our hospital surgeons, there are some who hold that extreme measures are *never* necessary, and that the judicious administration of opium, rest, and slight depletion, will always succeed in conquering the obstacle. Though we are not aware that Mr. Tatum holds exclusive opinions on this subject, we are happy to bring forward the following case, which will very satisfactorily illustrate what management, patience, opium, and warm baths can effect.

A strong-built, healthy-looking policeman, of dark complexion, was admitted under the care of Mr. Tatum, on the 23rd of April, 1850, with very distressing symptoms of retention of urine. The only particulars that could be gathered from him were, that he had had gonorrhœa twice; two years had elapsed since he was cured of the last attack, and six months after that event he had begun to experience the inconvenience of stricture. These symptoms were, however, removed by the use of bougies, and the urethra regained its former calibre. Since that time, however, (this circumstance showing well how strictured portions of the urethra will again and again retract after dilatation,) he had had two severe attacks of retention, one of which was overcome by opium and the warm bath, and the other by the introduction of an instrument. The day before admission, after being on duty all night, the patient had again obstinate retention; the surgeon to the police force tried to pass a catheter, but failed, both before and after the warm bath.

Under these circumstances, the man was admitted into the hospital complaining of very severe pain; he was covered with profuse perspiration; the countenance was anxious; the pulse small and frequent; the skin hot; the breath and perspired fluid emitted a urinous smell, and the hypogastric region was very tense and rather tender.

The house-surgeon tried to pass a small silver catheter without success, and the urethra bled a little. The patient was immediately put into a warm bath, a soothing enema was soon afterwards administered to him, and the catheter tried again, but to no effect. Forty minims of tincture of opium were next given, and the warm bath repeated.

Mr. Tatum saw the patient about four hours after admission, and now tried to pass a flexible catheter; this having failed, it was replaced by a silver one of the same size, which Mr. Tatum succeeded, after a patient and cautious manipulation, to pass into the bladder. About a pint and a half of urine was drawn off and the catheter left in the bladder, the house-surgeon being desired to complete the evacuation of the bladder in about an hour's time. The catheter was plugged and tied in the usual manner, and appeared to be quite secure, but the patient, now much relieved, having dropped off to sleep, the instrument slipped out of the bladder (or the patient drew it out) and towards night it was found impossible to re-introduce it, though the poor man suffered great pain from retention.

He was now ordered a saline draught, with ten minims of tincture of opium every sixth hour, but in spite of a large dose of laudanum, and a warm bath during the night, no water had been passed up to seven o'clock, A. M., the next day, when the patient presented the following symptoms:—Great pain, testicles violently drawn up; penis semi-erect, profuse perspiration, with a urinous smell; stinging pain about the perineum, and in the loins. At this time, the spasm partly relaxed, and the urine began to flow guttatim, and by the middle of the day, about a pint and a half was thus voided: the testicles resumed their natural state, but the bladder remained considerably distended; the tongue dry; the skin hot, &c. Mr. Tatum now tried to pass a silver catheter, a little hemorrhage ensued, but the instrument could not reach the bladder. The patient was then prescribed five grains of calomel, to be followed by a purgative draught, and eight leeches were applied to the perineum. The leeches abstracted a proper amount of blood, and the patient was then again placed in the warm bath, during which time a few drops of urine came away, but the appearance of the man was anxious and depressed; the pain in the region of the bladder and urethra agonizing; and the moment had come when puncturing the distended receptacle might fairly be proposed. Mr. Tatum gave, however, one more trial to opium and the warm bath; and at ten o'clock, the second day after admission, the urine passed a little more freely in the bath. After this, the symptoms became again as obstinate as before; another forty minims of laudanum and a warm hip-bath were resorted to, and Mr. Tatum at length succeeded in passing a small silver catheter into the bladder. About one pint and a quarter of urine was drawn off, the catheter plugged, and well secured in the urethra by means of tape, and orders left for the remaining portion of urine to be evacuated in about two hours.

The patient felt greatly relieved, and slept very well that night, though a little pain was experienced at the extremity of the glans, whilst the urine was being drawn off. Three days after Mr. Tatum had succeeded in passing a catheter, the patient who had several doses of laudanum, and warm baths, during the interval, began, when the instrument was removed, to pass his water in a small stream; and for the next thirteen days the stream became gradually larger, as a rising scale of catheters, up to No. 7, were successively introduced. Twenty-two days after admission the patient was discharged, passing his urine with ease, though the stricture still grasped No. 7, and he was desired to come to the hospital once or twice a week, to have the urethra dilated.

Now from what occurs commonly in these cases, it is but too apparent, that in spite of the skill and patience with which the treatment was here conducted, a recurrence of the same symptoms, upon the slightest irregularity, is extremely likely to happen; and such cases show, in a remarkable manner, how temporary is the benefit which is obtained by dilatation; the contractile nature of the stricture always tends to re-establish the coarctation of the canal, and we are thus involuntarily driven to look for means of permanent cure. It should likewise be noticed, that the men employed in the police force, by being very often exposed to wet and cold during the night, are more obnoxious than any other class of individuals to attacks of this nature; and it would almost seem proper to adapt a peculiar line of therapeutics with those very useful members of the community. They should be warned by their medical attendants, and prophylactic measures enforced among them.—*Lancet, July* 22, 1850, *p.* 756.

89.—FUNGUS OF THE TESTICLE.

By Dr. W. Senhouse Kirkes, and Holmes Coote, Esq., at St. Bartholomew's Hospital.

[Without dwelling upon the morbid changes occurring in the testicle, so accurately described by Mr. Lawrence about 40 years ago, we proceed at once to the consideration of this affection.]

The commencement of the disease, assigned generally to a blow, is very frequently, perhaps always, associated with the deposit of tuberculous matter, which, infiltrated amongst the tubules, acts as a source of local irritation, and produces inflammatory swelling. The abscess which ensues should be left to burst, and should not be punctured, unless, indeed, as is rarely the case, it excites greater pain than the patient can bear; as a rule, these abscesses do far better when allowed to pursue their own course, than when treated surgically.

After the discharge of any morbid deposit, the inflammation ceases, and the protruding fungus slowly recedes, unless the change of structure has been so considerable as to convert the fungus into a firm fibrous mass. Pressure in general aids the return of the protrusion, but from various causes it may be necessary to shave it off with the knife. The scrotum adherent to the remains of the gland then cicatrises over the wound. This latter mode of treatment is founded upon the belief, that the testicle is permanently destroyed as a secreting organ, after the full protrusion of the fungus. Perhaps after the giving way of the tunica albuginea, there remains but little chance of its returning to a healthy state.

From some recent observations, Mr. Syme has arrived at a different conclusion to that heretofore entertained of the capability of the testicle in these cases to return to its natural state, and to resume its usual functions. "When," he observes, "the fungous growth is divided longitudinally, that is, from the base towards the circumference, it may seem to consist of two textures distinguished by their colour and arrangement. One is brown, and disposed in straight lines, radiating from the base, where they are nearly or quite close together, towards the circumference, where they are more or less apart, according to the size of the excrescence. The other is white and granular, lying in the spaces which are afforded by the diverging rays. The former is composed of tubuli seminiferi, altered in situation, but not in structure; while the latter is simply organizable lymph that has been effused into the interstices." Upon this opinion, he recommends another operation, which, though more tedious than that recommended by Mr. Lawrence, is stated to have the advantage of preserving the glandular substance of the testis. The hard ring of integument round the fungus being removed, a longitudinul incision is made through the scrotum, which is separated from the adherent parts below, and then united by suture over the fungus. The results are stated to be satisfactory.

As it is obvious that the preservation of the organ in an efficient state is an object of very great importance, it becomes incumbent upon all to examine the accuracy of the observations upon which Mr. Syme founds his opinion, and to draw as much as possible further information from other instances of the same disease. It is stated, that, under the microscope, the tubuli show no signs of change of structure. That assertion, unless coupled with another, saying that the tubuli are unaltered in number, in the proportion of their constituents and in their relation to surrounding vessels, is of little value. Let us examine, under the microscope, a portion of the muscular substance of a heart affected with fatty degeneration, which has proved fatal to the patient; it rarely happens but that we can find portions of muscular fibre so healthy that they might be selected as specimens for demonstration; yet, who would infer from hence that the heart were healthy? The question now before us, with reference to the possibility of the restoration to a healthy state of the testicle affected with protrusion of the glandular substance, is one to be determined, partly by such evidence as can be relied upon from the patient himself, and partly by the result of accurate and repeated examinations in instances where the fungus has been removed.

[*Case.*—Joseph M., aged 34, upon recovering from an attack of pleurisy, found his left testicle enlarging, which, without pain, terminated in an abscess. This was opened: and two months after, there protruded from the cicatrix a vascular bleeding fungus. On admission, there was found adhesion of the scrotum to the left testicle, with an ulcerated opening and protrusion of a solid fungous mass. This fungous protrusion of the left testicle being unaltered in size, was shaved off by a scalpel.]

Examination of the Morbid Parts.—A thin layer of granulations covered a firm white fibrous mass, in which could be traced with some difficulty the remains of the tubuli seminiferi, much fewer in number than natural, soft, easily broken, and almost as pale as the surrounding structures. Under the microscope the white matter proved to be recently-formed fibrous tissue; it composed by far the greater part of the protruding mass. The tubuli were so soft that they broke under the most careful dissection. The epithelial cells were here and there arranged in their normal state; but were mostly indistinct, and mixed with a quantity of amorphous granular matter. The whole glandular structure appeared in a condition of advanced atrophy.

The wound of the scrotum healed readily, and, under proper treatment, the opposite testicle is recovering its normal size and condition.

About a year ago I examined the testicle of a gentleman who had suffered from this disease; the protruding fungus had retired by the application of pressure; the epididymis remained hard during life. The vas deferens was hard, and adherent to the surrounding parts; the canal was patent, but much smaller than natural, and mercury forced into it caused rupture of the coats; the tubuli seminiferi were very few in number, paler than natural, and intermixed with white fibrous tissue; the epithelium appeared unchanged under the microscope; but there was no trace of secretion in the tubes, as is usually the case when the canal of the vas deferens is simply obstructed or narrowed.

September 29, 1846.—I injected and examined a testicle which had been removed for this fungous protrusion of the tubules; minute injection flowed readily into every part, and coloured the external layer of granulations; the spermatic cord was thickened; the vas deferens and epididymis were unchanged in structure, but full two-thirds of the glandular substance was converted into a firm white mass, in which scarce a trace of tubuli seminiferi could be found; the fungus had made its way as usual through an opening in the tunica albuginea and the adherent scrotum.

I apprehend, that in these three cases the secreting power of the testicle was permanently destroyed; and no operation, undertaken with the view of preserving the organ, would have been followed by any good result.—*Medical Times, July*, 6, 1850, *p.* 9.

90.—OPERATION FOR PHYMOSIS.

By MM. Chassaignac and Vidal (de Cassis).

MM. Chassaignac and Vidal are respectively the authors of an operation for phymosis by the method of circumcision. That of M. Chassaignac consists of the introduction into the cavity of the prepuce of a blunt forceps, or any other dilating instrument with two branches, which in opening form the letter V. When the tension and flattening out of the prepuce are once accomplished, M. Chassaignac implants three needles in the base of the cutaneous triangle, which are passed through only the half of their length. They are then given to an assistant to hold, and the forceps are withdrawn. A fine strong thread is now taken, and a circular ligature made in front of the needles, which strangulates all the part of the prepuce that had been dilated. The scissors, carried perpendicularly in the furrow made by the ligature, divides at one cut integument and mucous membrane, after which the needles are passed quite through with their threads, the loops which they form between the opposite edges of the prepuce are divided, and twice as many separate ligatures as there were originally needles are thus obtained. The remainder of the operation consists in bringing the mucous membrane and the skin accurately into apposition at the edges of the wound, by means of the ligatures.

The reviewer in the 'Bulletin de Théraupeutique' claims for M. Vidal (de Cassis) the merit of having employed this process three years before it was proposed by M. Chassaignac. M. Vidal appears, however, to have since adopted another process. It consists in tracing with ink on the prepuce a line indicating the point where the section is about to be made, then grasping the prepuce with a dressing forceps, or a forceps of continuous pressure, in front of this line, the operator draws the prepuce a little forward, and having passed three needles with waxed thread through it at the line traced by the ink, divides at one cut the mucous membrane and skin. The following practical observations of this distinguished surgeon, in reference to the operation for phymosis, deserve attention:

"I have been hitherto in the habit of reuniting the mucous membrane and integument immediately after the section. But I have observed, after these instantaneous unions, ecchymoses of the sheath of the penis, thrombus of the base of the prepuce, infiltrations, and sanguineous collections, which prevented the immediate healing of the parts. I have, therefore, in regard to this operation, determined to follow the precept of Dupuytren, who allowed a certain time to elapse between the operation and the dressing. I perform the section at the commencement of my visit, during the remainder of which the wound is bathed with fresh water; and when I come again to my patient, the vessels have disgorged themselves, the wound no longer bleeds, and is in the most favourable circumstances for immediate union."—*Dublin Quarterly Journ. of Med. Science, August*, 1850, *p.* 120.

DISEASES OF THE SKIN.

91.—FAVUS.

By Professor **Bennett**, Edinburgh.

[Professor Bennett, in his clinical reports, first proposes saying a few words with regard to eruptions of the scalp in general, because of the frequency of their occurrence, and because great confusion has been thrown over the subject by systematic writers.]

There was a period in the history of skin diseases when they were arranged in two great divisions, viz., those affecting the scalp, and those affecting the rest of the cutaneous surface. All the disorders comprehended in the first of these divisions received the name of Porrigo, a word said by some to be derived from *porrum*, on account of the scales or concretions of the scalp, resembling the layers of an onion; by others, it is derived from *porrigere*, to spread. Willan described six kinds of Porrigo, viz., P. larvalis, P. furfurans, P. scutulata, P. favosa, P. lupinosa, and P. decalvans. It is now ascertained that none of these diseases are necessarily peculiar to the scalp,—and that, although they are more or less modified by growing among, and matting together, the hairs of that region, they may also occur on other parts of the skin. There can be little doubt, however, that the employment of the term Porrigo, as well as the corresponding word *Teigne* in France, has thrown great confusion over the subject of eruptions on the scalp. It will be well, however, as this term is still in pretty general use, to explain to you what diseases these different kinds of Porrigo really are.

Porrigo larvalis (*larva*, a mask) is really Impetigo, or Eczema impetiginodes of the scalp. The former is recognised by crusts more or less prominent or nodulated; the latter, by the circumstance that, in addition to these nodules, there is between them a laminated or brittle crust, spread more or less equally over the surface. They are both very common in infants and children; and, as the disease sometimes extends over the face, concealing the features, hence the term *larvalis*. A very characteristic representation of impetigo capitis, which I now show you is given in *Willan* and *Bateman*, Plate xli., erroneously called Porrigo Favosa.—See also the disease on the face. *Ibid.*, Plate xxxvii. *Alibert*, Planches 13 and 15.

Porrigo furfurans (*furfur*, bran) is really Pityriasis of the scalp, although Psoriasis of that region has also received the same appellation. There is also a peculiar form of Eczema or Eczema impetiginodes, in which the crust is friable, and breaks up, or crumbles into minute fragments, to which the term furfurans has been erroneously applied. The true Porrigo furfurans (Pityriasis) is well represented.—*Willan* and *Bateman*, Plate xxxviii. *Alibert*, Planches 14 and 15.

Porrigo scutulata (*scutulum*, a small shield).—The nature of this disease has been much disputed. By some, it is said to be Favus (Erasmus Wilson), by others a form of Herpes (Cazenave, Neligan, Burgess). The disease is described by Willan and Bateman, and more recently by Burgess, to consist of oval or rounded slightly elevated patches, covered with furfur, and having stunted or filamentous hair projecting from the surface. It is a form of skin eruption exceedingly rare in Edinburgh. It seems to be represented, *Willan* and *Bateman*, Plate xxxix. *Willis*, (Trichosis Scutulata).

Porrigo favosa (*favus*, a honeycomb) is a disease, the true nature of which has been only lately determined. It consists essentially in an exudation on the skin, in which fungi or phytaceous plants grow. Round, isolated, bright yellow crusts are formed, which when compressed together, assume an hexagonal shape. Hence the term *favosa*. It is well represented, *Willis*, (Trichosis lupinosa) *Erasmus Wilson*, Fasciculus I. *Alibert*, Planche 17.

Porrigo lupinoso (*lupinum*, the lupine).—This is the same disease as the last. The round or oval crusts when isolated, and at an early stage, present a concavity and form, resembling that of the lupine seed—hence its name.

Porrigo decalvans (*calvus*, bald).—Baldness is so common among the aged, that it can scarcely be called a disease; but when it occurs in young persons, and is circumscribed, it constitutes the Porrigo decalvans of Willan. It is said by Gruby to depend on a vegetable parasite growing in the hair. It is well represented, *Willan* and *Bateman*, Plate xl. *Willis*, (Trichosis Decalvans.)

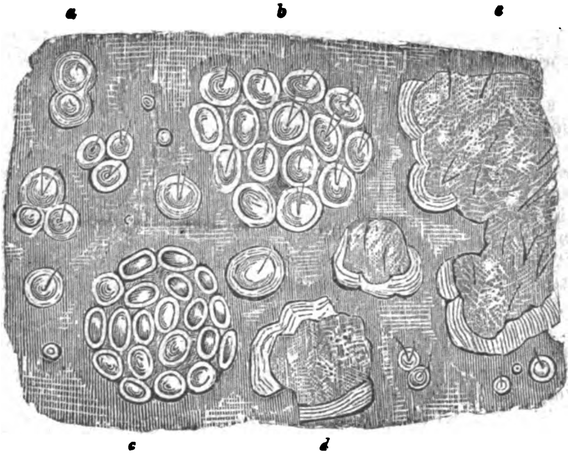
From this analysis of the different kinds of the so-called Porrigo, you observe that there is nothing peculiar with regard to them. With the exception of baldness, none essentially belong to the hairy scalp. True favus is far more common on the head than elsewhere; but I have frequently seen it on various parts of the cutaneous surface, and occasionally on the cheeks or shoulders, without being on the scalp at all. I propose, then, abolishing this term Porrigo altogether, and, in future, making use of the term Eczema Impetigo, Pityriasis, Prosiasis, or Favus of the scalp, as the case may be. It is this latter disease that I now propose to describe to you more particularly.

History of Favus as a Vegetable Parasite.—The demonstration by Bassi of the vegetable nature of the disease named muscardine in silk-worms, which causes so great a mortality among those animals, opened up to pathologists a new field for observation, and led to the discovery, that certain disorders in the higher animals, and even in man himself, were connected with the growth of parasitic plants of a low type. Schönlein, of Berlin, was the first to detect them in favus crusts,—an observation confirmed by Remak, Fuchs, and Langenbeck. Gruby gave a very perfect description of these vegetations, in 1841, and made numerous researches as to their seat, origin, and mode of propagation. These were repeated by myself, and further extended in 1842. In 1845 I succeeded in inoculating the disease in the human subject. Since then they have been made the subject of further investigation, by Lebert, Remak, Robin, and numerous other inquirers.

[As to the mode of development and symptoms of favus, some describe it as commencing in a pustule, and others as in a crust, but,]

It would appear that the first morbid change is increased vascularity of the skin, accompanied with a desquamation of the cuticle; and that in a period varying from twelve to fourteen days, small spots of a bright yellow colour, like that of sulphur may be detected. These gradually augment in size; but even at the earliest period, may be observed, with a lens, to have a central depression, through which a hair may generally be observed to pass. The crust or capsule may enlarge to about the size of a shilling, and if it be isolated, still retain its rounded form. Usually, however, its edges come in contact with other capsules, and then it loses its rounded shape, and assumes the hexagonal and honey-combed appearances described by authors. I consider, then, that the so-called porrigo lupinosa, and porrigo favosa, constituting distinct forms or varieties of some writers, are merely different stages of the same disease, and dependent upon the greater or less aggregation of the crusts. On the first appearance of the capsule, its edges are somewhat depressed below the surface of the cuticle; but as it increases in size, they become more and more elevated, and at length are very prominent. At first, also, the whole capsule, appears of a homogeneous bright yellow, but when further developed, its centre assumes a whiter colour. This arises from the aggregation of the sporules of the plant, which are more abundant in this situation. As the development proceeds, this central yellow whitish mass assumes a mealy, powdery consistence, and encroaches upon the edges of the capsule, which gradually disappear, whilst its upper concave form becomes convex, as Gruby pointed out. In general an inflammatory ring is seen round the crust, which as the capsule becomes elevated above the skin, enlarges, and assumes a deeper colour, indicative of the increased local irritation. At length the whole cracks or splits up; all regular form is lost; a dense thick crust covers the scalp; an odour, like the urine of cats or mice, is evolved; and in chronic cases, vermin deposit their eggs in the interstices, and crawl in large numbers over the surface.

The other local symptoms are merely those which result from the greater or less degree of irritation produced in different persons by the changes above referred to. At first, scarcely any uneasiness is felt; perhaps occasional slight itching at the part. As the disease progresses, however, the itching becomes



a, Isolated crusts of Favus, presenting the lupine seed-like depression in different stages of growth (so called *Porrigo lupinosa*); some are arranged in groups of two and threes. *b*, A larger group of these crusts, somewhat compressed at the sides, like a honeycomb (*Porrigo favosa*). *c*, Another group, which occurred on the shoulder of a young girl. No hairs passed through the centre of these crusts. *d*, Large isolated crusts in an advanced stage of growth, the external ring is cracked, and the friable centre is enlarged and elevated. *e*, Numerous crusts aggregated together, so as to form an irregular elevated mass. Traces of the original form may be observed in the cracked rings round the margin. (Natural size.)

more intolerable, and induces the patient to rub and scratch the scalp. By these means, several of the crusts are forcibly torn from their attachments, and considerable effusion of serous fluid and blood is produced. Sometimes inflammation is thus occasioned. Impetiginous pustules are frequently formed, or suppuration produced, terminating in ulceration, and the discharge of an icherous fluid from beneath the crusts. At an advanced stage of the disease, the peculiarly offensive odour exhaled is insupportable to those who surround the individual, and the icherous discharge, vermin, and crusts, which cover the affected parts, present a most disgusting appearance.

Although the disease most commonly attacks the hairy scalp, it may occur on the forehead, temples, cheeks, nose, chin, ears, shoulders, arms, abdomen, lumbar region, sacrum, knees, and legs. Alibert gives a plate in which it is figured in all these situations. I have myself seen it on the cheek, shoulders, back, arms and inferior extremities, and in some of these situations I could detect no hairs perforating the capsules.—(See Fig.)

The constitutional symptoms are of the utmost importance, but, generally speaking, receive little attention from practitioners. In most of the individuals affected, who have come under my notice, the general health has been greatly deranged, and a scrofulous or cachectic constitution more or less evident. In some the *facies scrofulosa* of authors has been well marked; in others there were engorgements of the lymphatic glands of the neck; and in the only fatal case which has come under my observation, there were found tubercular depositions in the lungs, mesenteric glands, and other textures. Indeed, the generality of individuals who die labouring under favus, perish from phthisis, or other forms of tubercular disease.

By those not well accustomed to the diagnosis of skin diseases, favus has often been confounded with other eruptions of the scalp, more especially eczema and impetigo, or the combination of these diseases known as the eczema impetiginodes. In none of these eruptions, however, do the yellow crusts or scales present traces of vegetations when examined microscopically. This, therefore, furnishes the real diagnostic and phathognomic character of the disease.

That the disease is inoculable, and capable of being communicated by contagion, there can be no doubt, a result which accords with the observations of most practitioners, and with numerous recorded facts. It does not readily spread to healthy persons, and there must be either a predisposition to its existence, or the peculiar matter of favus must be kept a long time in contact with the skin.

[With regard to the pathology of the disease, Professor Bennett says:]

With the exception of Mr. Wilson, who seems carefully to have examined the favus crust, the opposition to the vegetable nature of this production, seems to have originated in very imperfect notions as to its intimate structure on the one hand, and that of certain cryptogamic plants on the other. For if long hollow filaments, with partitions at intervals, containing molecules within their cells, springing from an unorganized granular mass, and giving off towards their extremities round oval bodies, or sporules, arranged in bead-like rows, be not vegetables, what are they? The animal tissues present nothing similar, while numerous plants, long known to botanists, present the same identical structure. But not only must they be referred to the vegetable kingdom, but to a considerably elevated position among the cryptogamic plants.

With regard to the idea of Mr. Erasmus Wilson—that they are modifications of epidermic cells—it must be observed that this touches upon a great question in pathology—namely, whether particular cells have certain definite characters and modes of development, or whether one kind of cell may be modified into others. I have frequently asked myself whether accidental circumstances might not transform an epithelial or hepatic cell into that of cancer, or whether various healthy cells might not become morbid ones. Without entering into this subject at length, I need only state my opinion that, in the present state of science, every fact leads to the conclusion, that cells, once formed from a blastema, always advance according to laws originally impressed upon them. Consequently, epidermic cells, though they may be transformed into hair, horn, or other epidermic structures, cannot be changed into pus cells on the one hand, or into those resembling vegetable growths on the other. If this view be correct, it follows that we must regard the branches and sporules in the favus crust, as consisting of true vegetable parasites, and as cryptogamic plants, growing in the animal textures.

M. Cazenave, in his recent work, supports the opinion, that the sebaceous glands are the primary seat of favus. He states that the disease *always* forms round a hair, and is never produced if the follicle be obliterated, or on a cicatrized surface devoid of hair. He considers the matter of favus to be a peculiar secretion, or a modification of the normal matter secreted by the sebaceous glands, analogous to what exists in *acne sebacea*.

Mr. Erichsen considered, "That the matter of favus is a modification of tubercle—that it is a tubercular disease of the skin. By tubercular I do not mean a disease like lupus, characterised by small firm tumours, but a disease, the nature of which consists in the deposition of that *heterologous* formation called tubercle. This view of the nature of favus I have long held; and it was distinctly stated by me, when treating of the pathology of scrofula, in a work published in 1841. The favus crust, however, is not constituted alone of tubercular matter. This peculiar exudation only constitutes the soil from which the mycodermatous vegetations spring, as I shall now endeavour to show.

Gruby describes the micodermata of favus as springing from an amorphous mass, of which the periphery of the capsule is composed. This mass undoubtedly exists, and, according to my observations, is composed of a finely molecular matter, identical in structure to certain forms of tubercle, or recently coagulated exudation. The cheesy matter, for instance, so frequently found on the secreting surface of serous membranes, and in tubercular cavities and other structures in chronic cases of tuberculosis, or general tendency to tubercular deposition, presents this character. Every pathologist who has minutely examined tubercle, recognises a granular form, in which there is no trace of nucleus or cell, and which, therefore, we are warranted in considering as unorganised. I have myself repeatedly examined this tubercular matter, and been unable to detect any difference between it and the mass in which the vegetations of favus appear to grow. Chemical analysis of this form of tubercle demonstrates it to be composed principally of albumen, with a minute proportion of earthy salts; sometimes there is combined with it a small quantity of fibrin or gelatine. If this general result be compared with the analysis, by Thenard, of favus matter, the identity between it and tubercle must appear highly probable. He found in 100 parts—coagulated albumen, 70; gelatine, 17; phosphate of lime, 5; water and loss, 8 parts. Thus the evidence furnished by morphology and chemistry, agree in determining the molecular matter found in the crusts of favus and of tubercle to be analogous.

All the facts which recent researches have brought to light, only tend to confirm the conclusion which I arrived at on this subject in 1842, as expressed in the following passage:—

"In man all the vegetations yet discovered have been found connected with the matter effused into the textures in scrofulous constitutions. The fungi found by myself, for instance, growing in the tuberculous cavities of the lungs, and those discovered by Schönlein, and described by Gruby, constituting scrofulous eruptions on the skin, grew on a finely granular amorphous mass, which presented no evidence of organisation. Chemical researches have shown, that this form of tubercular matter is principally composed of albumen,—which explains the large proportion of this animal principle present in the crust of the porrigo or tinea favosa, according to the analysis given by Alibert. The fungi found by M. Eudes Deslongchamps growing on the membranous lining of the air-passages in an eider-duck, sprung from an "albuminous layer," "forming the soil on which they grew." The mould, or mucor, discovered by Owen growing in the lungs of the flamingo, occupied the same situation as those observed by myself in the lungs of man,—viz., the lining membrane of tubercular cavities. The fungi found by MM. Rousseau and Serrurier in the parroquet grew on a species of false membrane. What the nature of this membrane was is not stated, but it is distinctly mentioned that the animal died of laryngeal and pulmonary phthisis. In pigeons, also, the same authors describe it as commonly induced by exposure to cold and moisture, circumstances well known to be the most common cause of scrofula and tubercular depositions.

I believe, therefore, that the pathology of favus is best understood by considering it essentially to be a form of anormal nutrition, with exudation of a matter analagous to, if not identical with, that of tubercle, which constitutes a soil for the germination of cryptogamic plants, the presence of which is pathognomonic of the disease. This matter may be found primarily or secondarily. That is, there may be want of vital power from the first, as occurs in scrofulous cases, or there may have been production of cell forms, such as those of pus or epidermis, which, when disintegrated and reduced to a like molecular and granular material secondarily, constitute the necessary ground from which the parasite derives its nourishment, and in which it grows.

[Dr. Bennett remarks on the treatment of this disease, that almost every kind has been had recourse to in order to remove this disagreeable and intractable disease; and no doubt cases have been cured by all or any of the methods recommended.]

I have endeavoured to show, however, that in many cases it is a constitutional disease, and dependent upon the causes which induce scrofulous diseases in general. The treatment, therefore, in such ought to be constitutional; and directed to remove the tendency to tubercular exudation, on which the malady depends. No doubt, however, a local treatment in this, as in all disorders which are at the same time general and local, is of the utmost service.

I consider, then, that the chief indications of treatment are, 1st, To remove the constitutional derangement; and 2ndly, To employ such topical applications as tend to prevent the development of vegetable life. This line of practice may be thought similar to that recommended long ago by Lorry, who advises, 1st, A modification of the fluids and solids of the economy by a general treatment; 2ndly, A vigorous attack upon the local disease by topical applications, capable of removing the crusts, causing the skin to suppurate deeply, and substituting a solid cicatrix for the morbid ulceration of the hairy scalp. For the most part, however, the general treatment of physicians has been confined to diluent drinks, blood-letting, purging, and remedies which depress the vital powers, whereas it must be evident, that if the views of its pathology I have brought forward be correct, and it is in its nature allied to tubercular affections, a treatment exactly opposite ought to be pursued. The development of vegetable life may also be prevented by the application of much milder remedies than the escharotics, or irritating ointments usually employed.

The treatment of scrofula will be fully entered upon by me in a subsequent lecture. Suffice it to say at present, that I shall endeavour to show how this peculiar cachexia is caused and kept up by some fault in the digestive process; that the blood is secondarily affected, and its albuminous constituents proportionally increased; that the albumen at length becomes effused into the different structures of the economy, causing the various forms of tubercular disease; and lastly, as the albumen in the blood becomes excessive, and its effusion into the textures increases, the fatty constituents of the frame diminish. It will be shown, by an appeal to numerous facts, that under such circumstances the internal and external exhibition of cod-liver oil has been attended with the most marked advantage, and often been made the means of cure when all other remedies have failed. The action of the oil appears to be the same in favus as in other forms of scrofulous disease, and its use should be combined with appropriate diet and exercise, and with reference to the same indications and contra-indications. As it is my intention to describe these minutely on some other occasion, it is unnecessary for me to allude to them at present.

The local treatment I have employed for several years, is directed, in conformity with the pathological views previously detailed, to the exclusion of atmosphèric air, so as to prevent vegetable growth. For this purpose, I direct, in the first instance, that the affected scalp should be poulticed for several days, until the favus crusts are thoroughly softened, and fall off. Then the head is to be carefully shaved, after which it will be found to present a shining clear surface. Lastly, cod-liver oil should be applied with a soft brush, or dossil of lint, over the affected surface morning and night, and the head covered with an oil-silk cap to prevent evaporation, and further exclude the atmospheric air. Every now and then, as the oil accumulates and becomes inspissated, it should be removed by gently washing it with soft soap and water. It is very possible common lard would do as well as cod-liver oil; and I observe that Dr. Girot has lately recommended olive-oil as a local application.

I have found the average duration of this treatment to be six weeks, which contrasts very favourably with the results of M. M. Mahon's practice at the Hôpital, St. Louis, Some cases seem to be incurable, and these are most frequent among adults, but even in them, so long as the scalp is kept moist with oil, and excluded from the air, the eruption will not return. In young subjects, in whom general as well as local treatment is admissible, and in whom a scrofulous disposition is manifest, the prognosis is more favourable, and the disease may be permanently eradicated. Whenever favus is recent and of limited extent, it may at once be destroyed by cauterization with nitrate of silver.—*Monthly Journal of Med. Science, July*, 1850, *p*. 43.

92.—ECZEMA.

By Professor BENNETT, Edinburgh.

[Dr. Bennett records two cases, one in a painter, aged 40, who had had an eruption twenty years. The other in the person of a widow, aged 26, which appeared to have arisen from an injury to her elbow from a fall five months before admission. Professor Bennett observes,]

Eczema essentially consists of diffuse crops of minute vesicles, seated on an inflamed red surface, which, on breaking, yield a thin serous lookng fluid that coagulates on the surface, so as to form a flat laminated scab. There is almost always intense itching, or a feeling of burning or smarting, often very painful; symptoms most intense in acute, but also present in chronic, cases. In these last, the skin often assumes an unusual degree of induration, a more or less deep red colour, and presents cracks and fissures, giving rise to great uneasiness. The first case above detailed is one of this kind, and presented all the characters of extreme obstinacy. The second case was more acute. Both were treated with local applications only, and with the best results.

The application I employ is a solution of ʒ ij. of the subcarbonate of soda, in a pint and a half of water. But an alkaline lotion in itself, applied from time to time, as is most commonly done, will not prove of any great service. I have found it necessary to place lint, saturated with the solution, over the affected parts, and to cover the whole with oil-silk, in order to prevent evaporation. Keeping the surface moist seems to me a necessary part of the treatment. The usual effect is soon to remove all local irritation, and especially the itching or smarting so distressing to the patient; to keep the surface clean, and prevent the accumulation of those scabs and crusts which in themselves often tend to keep up the disease. After a time, even the indurated parts begin to soften, the margins of the eruption lose their fiery red colour, merge into that of the healthy skin, and finally the whole surface assumes its normal character.

I am quite satisfied that this local treatment is far superior to the stimulating ointments and lotions, which are so frequently used one after the other, in the hope of overcoming these obstinate forms of eruption. Many of them, indeed, only seem to augment the disorder. In these cases there is an increased exudation from the skin, not only of sebaceous but of purulent matters. Alkalies, we know, have the property of dissolving these, and acting as a calmative and emollient to the irritated part. Their constant action on the skin, therefore, in the manner I have described, may easily be imagined to be productive of benefit. But if, as is usually done, alkaline lotions and baths are only employed from time to time, they remove the sebaceous matter, leave the skin dry and harsh, and thus these applications often irritate. Keeping the surface, covered with moist lint, on the other hand, while it serves to protect, removes the results of exudation, and prevents incrustation.

I do not wish it to be understood that this is the *only* local application which can be useful in these cases, but that I have found it more extensively applicable, and more uniformly serviceable than any other.—*Monthly Journal of Medical Science*, *July*, 1850, *p*. 59.

93.—PSORIASIS.

By Prof. Bennett, Edinburgh.

[Of this disease Dr. Bennett describes three cases. The first occurring in a baker, aged 36, over the inferior extremities and various parts of the trunk. The second in a washerwoman, aged 36 also, which appeared subsequently to an attack of cholera: and the third in a servant, aged 15, in whom the eruption had appeared eight months previous to admission, first on the inferior and then on the superior extremities.]

So-called lepra vulgaris, psoriasis diffusa, psoriasis gyrata, psoriasis guttata, and psoriasis inveterata, are one disease, more or less chronic. In the works of systematic writers, the varieties of this affection are multiplied indefinitely, even to giving minute separate descriptions of it, as observed on the eyelids, lips, prepuce, palms of the hands, nails, &c., &c., &c. The sooner you disembarrass yourself of all such useless distinctions the better.

The real nature of psoriasis is altogether unknown. I am not aware that any researches have been made as to the alterations which the structure of the skin undergoes in the disease. All that can be said is, that, as we see a considerable redness, there can be little doubt of there being a congestive state of the vessels, combined with increased amount and desquamation of the cuticle There is no exudation, properly so called, but an increased growth, or an hypertrophy of the epidermis.

Observation has shown that this, like many other skin diseases, is sometimes connected with a deranged state of the digestive organs, sometimes with a constitutional disorder, very little understood, whilst in others (but these are comparatively few) it is more or less dependent on local causes. A judicious treatment of this disease will materially depend on a correct appreciation of one or the other of these circumstances, or of their various combinations.

The constitutional treatment which I have found to be most efficient in cases of psoriasis, is the administration of equal parts of Fowler's solution, and of tincture of cantharides, in doses commencing with ten drops, gradually increased to fifteen or twenty. The effects of this medicine must, of course, be carefully watched. Of all the local applications, most dermatologists are agreed that the best is pitch ointment. It seems to exert a specific action on the skin in these cases, and of its value there can be no question.

You will occasionally find, however, that it causes considerable irritation, in which case it should be diluted with an equal part of lard. In Case I. this occurred, and simple ointment only was employed, which, combined with the internal use of arsenic, was sufficient to produce a cure. In Case II., the arsenical and cantharides drops, combined with pitch locally, brought about recovery; whilst, in Case III., the same result was obtained by the local application alone. Such is a fair specimen of what you may expect in the treatment of this disease. Some cases getting well under arsenic alone; others, under pitch ointment alone; whilst a third case will require the action of both.—*Monthly Journal of Med. Science, July*, 1850, *p.* 60.

94.—THE TREATMENT OF PSORIASIS AND LEPRA-VULGARIS.

By M. Emery.

The following is a sort of statistical balance-sheet drawn up by M. Emery as the result of his experience in the St. Louis Hospital of Paris:—

He states that, after having failed to obtain any good amount of success from following systematic plans of treatment,—such, as the purgatives of Hamilton, the blood-lettings of Duffin, Wallace, and Graves, and the lunar caustic applications of Alibert,—he adopted the plan of Biett, who had introduced the treatment by arsenical preparations, tincture of cantharides, and frictions with iodide of sulphur. Here are the results of these methods in his hands:—"I have treated with different preparations of arsenic 140 cases of psoriasis, or lepra vulgaris, and have kept note[illegible]em. Of these only 38 have gone out apparently cured, after two, four, six, eight, and even fifteen months of treatment. Within six months, six of these (three women and two men) had returned to my wards. Within eighteen months, I had readmitted twenty-two. I have never again seen the other sixteen. Of the 102 other cases, forty went out covered with darkish spots, having scales of psoriasis alongside of them, or even upon them, but in small quantity. Before the end of a year, I saw twenty-four of these again. The shortest treatment had been three months, and in eighteen of them (eleven men and seven women), the duration had not been less than a whole year. The remaining sixty-two had so often suffered from various accidental ailments, produced by the remedies, that after eight or nine months of ineffectual treatment, I submitted forty of them to tar ointment frictions for two or three months, when they went out cured. On twelve of them I had tried tincture of cantharides, but only cured one solitary case,—the other eleven went out of hospital without much improvement, after remaining in a year. Lastly, of the remaining ten I treated two with ointment of napthaline (one part to fifteen of axunge). These were cured in six weeks. I treated eight with proto-iodide of mercury ointment (one part to sixteen); an ounce of this being used daily, which, in four, produced sharp itching, and in two swelling of the gums, with salivation, after a month of treatment. They seemed radically cured in two months and a-half." In all these cases the various forms of treatment were accompanied by simple or sulphurous baths, or with the vapour bath or vapour douche. The preparation of arsenic which he found to answer best was Fowler's solution, in doses of from five to eighteen drops. The arsenical plan is not without a certain amount of danger, and sometimes it has to be suspended six or eight times in the course of the treatment; but M. Emery has no hesitation in proclaiming it to be the best of all the internal remedies.

He then refers to external remedies, and after noticing a great many which had failed in his hands, he mentions his having himself introduced, in 1836, tar ointment in large proportion (a fourth or a third of a part [illegible]ar to two or three parts of axunge), against which no graver objections have been offered by the many practitioners who have adopted it, than its soiling the linen and being palpable to the senses. It cures more rapidly, and as surely as any other remedy. Even in the largest quantities it does not injure the health, and only produces occasionally a few superficial pustules which heal rapidly. He had treated by this means from fifteen to eighteen hundred cases, had cured more than five-sixths of them, and never saw any unpleasant consequences attend its use. He at first employed along with it calomel and sulphuric acid internally, and sulphureous baths externally; but discontinued them, not only because they appeared to be useless, but because they seemed even to retard the cure. He subsequently contented himself with a few simple baths at long intervals. He thinks patients treated in this way not so liable to relapses as those treated by internal remedies alone, and especially by arsenic. Upon a suggestion of M. Cazenave, however, he tried a combination of the external treatment by tar and the internal administration of arsenic, and the following are the results:—"I have treated by this method 228 cases of psoriasis, and cured 200 in the average space of six weeks to two months. I have had very few effects of the nature of poisoning, having seldom exceeded ten drops of Fowler's solution daily. I have observed that by this treatment the disease underwent at the same time two curative processes: the scales of psoriasis are by the tar effaced from the circumference to the centre, and by the arsenic they diminish in thickness and assume a blackish grey tint. By combining these methods of treatment, these two phenomena manifest themselves at the same time."

In the cases which resisted this treatment, amounting to about a seventh of the number, M. Emery tried various mercurial preparations, but found only one to succeed,—that of M. Boivet, which is one part of proto-iodide of mercury to eight of axunge; but it has the disadvantage, when applied over large surfaces, of frequently causing salivation. Another ointment which is also of some value is that of iodide of sulphur, containing from one part in thirty-two to one in eight of lard. Psoriasis of the scalp yields to this, but it is apt to cause erysipelas, when applied over large surfaces, and especially when used of the strength of one to eight. M. Emery's conclusions, then, are,—"That arsenical preparations, and especially Fowler's solution, are the best internal remedies; that tar takes the first place as an external application; that the combination of these is the best treatment for psoriasis; that the iodide of mercury ointment is occasionally useful when judiciously applied, and next to it the iodide of sulphur."

He also tried, on the faith of an article in the 'Gazette des Hôpitaux,' about three years ago, baths containing five drachms of bichloride of mercury, which were said to cure psoriasis in eight days.

These baths were tried first in twenty-two cases, (fourteen males and eight females), subsequently upon twenty others, sixteen of whom were under fourteen years of age. None were cured, while several suffered severely from the remedy. M. Gibert had also tried these baths in fifteen cases, and failed in all of them: so that the inutility of this remedy appears to be settled.

M. Emery adds that too great reliance must not be placed upon the certainty of the cures, as relapses are numerous,—the same causes which produced the disease being apt to cause its recurrence. Dietetical and hygienic measures must also be adopted: the diet mild and not too substantial; all aliments difficult of digestion to be avoided, especially salted meats, the richer kinds of fish, and fried articles. The patients should take regular exercise, use baths frequently, and have recourse again to the treatment which had benefitted them, on the least appearance of the disease, without waiting till it has developed itself extensively.

The following is his method of applying these remedies:—"Before commencing the frictions I order a bath, and make slight frictions with the ointment the moment the patient comes out of it. This is repeated three times daily, and at the end of two or three days I increase the quantity of the ointment and the activity of the frictions. After six or seven days the patients have the ointment constantly upon them; and when the disease is of long standing I cover the larger patches of eruption with compresses spread with the tar ointment to the depth of a line. The patients take a tepid bath once or twice a week. It is rarely necessary to suspend this treatment. There are, however, subjects with very irritable skins, in whom it produces, occasionally, a few impetiginous pustules or some small boils; but very often they continue their treatment in spite of these. In about ten days, there is observed in the patches of psoriasis, from which the scales have separated, a whitish circle around them, which gradually extends from the circumference to the centre. This is the first indication of the decrease of the complaint, which commonly disappears in the space of two or three months, without the patient experiencing any change in his general health. In the lepra vulgaris the centre commences to break up. The rings, which from the circular chain of eruption, separate, and then follow the same course as the psoriasis.

The Fowler's solution should be given cautiously, beginning with five drops in four ounces of liquid, which is divided into two portions. An additional drop is given each day; and if no unpleasant consequences follow, the quantity may thus be rapidly raised to twelve drops daily. If it is observed that the patches of eruption become thinner, and assume a blackish-gray colour, the dose is not increased further for fear of accident, as the above appearances indicate saturation of the system. When, on the contrary, the patient bears the remedy well, and there is no appearance of improvement, the Fowler's solution may be augmented in quantity to fifteen or sixteen drops, which it is rarely necessary to exceed.

"The skin sometimes becomes the seat of rather sharp pain, or, without being absolutely painful, becomes hot and slightly red around the patches; a few tepid baths, diluent drinks, and the diminution of the dose of arsenic, suffice to remove these slight symptoms. There are some delicate stomachs which cannot support the arsenic even in the smallest doses; and when that is fairly established we must have recourse to some other treatment. Sometimes, after continuing the above treatment for fourteen or fifteen days, there occur sense of constriction in the throat, and rather severe pain in the stomach. The whole treatment must then be suspended. These symptoms disappear in two or three days. The arsenic may then be resumed, recommencing with five drops in the day, and increasing the dose by one drop every second day. The pains in the region of the heart, which render all its pulsations painful, sometimes make it necessary to have recourse to blood-letting. The symptom demanding most attention is, undoubtedly, contraction of the extensors of the limbs. So soon as this shows itself the arsenic must be abandoned, or we run the risk of seeing this increase and become rapidly incurable.

"When the patients have been able to bear full doses of the remedy, and when the patches of eruption have given place to spots of a blackish-gray colour, the use of the arsenic may be discontinued, and the treatment limited to baths and vapour douches. The saturation is then complete, and the arsenic would not then act any farther on the system at large. These spots which announce the approaching cure, may not disappear till after some months of treatment."—*Bul. de Therap.*—*Monthly Journal of Med. Science, September*, 1850, *p.* 274.

95.—CUTANEOUS CANCER OF THE ANKLE.—AMPUTATION OF THE LEG.

Under Mr. Barnard Holt, at the Westminster Hospital. Reported by John Milton, Esq.

[The patient, a girl aged 24, suffered about fifteen or sixteen years ago, from a tumour about the size of a marble on the right foot under the inner ankle, which was removed by Mr. Liston, but the cicatrix remaining from the operation never became white and firm, but was always covered with a thin dry scab. About four years ago, a second tumour formed above the first, which gradually increased in size, and at last burst, discharging some matter. The part was poulticed, but no relief being obtained, Mr. Holt removed the tumour, which was about the size of a walnut.]

But it soon began to manifest greater activity, and to display its malignant and dangerous nature. The granulations, instead of being small and healthy, increased in size, and though attempts were made to destroy them by means of escharotics, they still grew larger, and a cherry-coloured nodulated mass arose as large as an egg: in washing it she constantly removed small, black coagula. Yet up to a late period she was able to walk; she could not bear a boot to be laced on the ankle, and setting the foot to the ground when she rose to begin walking was very painful, but this over, she could go pretty well. As there appeared no probability of saving the foot, she was made an in-patient on the 7th of May, and on the 23d of June, Mr. Holt removed the leg between the upper and middle thirds. On examination the disease was found to be confined almost entirely to the skin, having attacked none of the deeper-seated tissues, except the adductor pollicis.

[No untoward symptom occurred after the operation, except a gland which suppurated on the inner and upper part of the thigh.]—*Med. Times, Aug.* 10, *p.* 144.

96.—CHIMNEY-SWEEPER'S CANCER.

Under Mr. Holt, at the Westminster Hospital. Reported by John L. Milton, Esq.

[It is stated that this disease is seen perhaps to a greater extent in the hospitals of London than in any other institutions in the world. Although it is supposed to proceed from soot irritating the scrotum, yet there are reasons to doubt whether the presence of soot or any other dirt is essential to the disease, as it is stated to have been seen in persons unexposed to the influence of soot; and the disease is unknown in Paris, where the lower orders of the population are infinitely filthier in their persons than the same class in London. In the following case, however, the patient had certainly been exposed to the action of soot.]

The disease first appeared like a small pimple, the top of which he repeatedly scratched off; by-and-by a little fluid oozed from the abraded surfaces, which gradually increased in extent till about four months ago. At this time its development seems to have received a sudden impulse, and it speedily increased in size. He began to dress it with poultices, which produced free suppuration, and gave him great relief. He never applied to any one for advice, so that the progress of the disease was quite uninfluenced by any foreign applications. He was admitted into the hospital, under Mr. Holt, on the 2nd of July, the growth having, by this time, attained the size of the tips of three fingers, and become very painful; the pain was of a lancinating character, and accompanied by beatings which gave him the sensation of the ticking of a clock.

As his health had now suffered considerably, he was operated on four days after admission, the incisions being made transversely. Some hemorrhage took place on the 8th, which impeded the progress of union by the first intention, but, by the 20th, the cicatrix had formed firmly, except over a minute line; the case may, therefore, be considered as having terminated favourably, though only a long period of time can assure us that there is no danger of relapse. The patient, however, leaves the hospital in a most gratifying state of improvement.

Respecting the mode of growth by which the scrotum is replaced there seems some obscurity. Mr. Liston says "it is astonishing how completely and in how short a time these glands (the testicles) receive a new covering at the expense of the surrounding healthy skin." The fact is well known, but we have not been able to meet with any very satisfactoy account of the manner in which it occurs. In cases like that we have just recorded, where a small portion of the scrotum is removed, it is very easy to imagine how this structure, loose and extensile, may be greatly stretched by the pull of the ligatures; bnt there are facts which tend to show that independent of this the scrotum would of itself cover the testicles. Mr. Lynn on one occasion removed the whole of the scrotum, and yet the testicles were soon covered. In his wards there is now a man whose testicles were denuded by sloughing of a large portion of the scrotum, the consequence of exposure to cold and want. A short time ago, when we first saw this man, the testicles were exposed; three weeks after the edges of the scrotum had approximated within a very short distance of each other, though no mechanical means had been used to bring them together, the part having been only dressed with poultices, and now the superior portion of the scrotum has advanced downwards so far over the testicles that the lesion is only seen by looking over the projection formed by the lower end of it. May it not, then, be rather some remnant of that organic attraction which unites the two portions of the embryo at the mesial line, that performs this useful service, and thus remedies the loss of large portions of this membrane by disease or operation?—*Medical Times*, *Aug.* 10, 1850, *p.* 144.

97.—TREATMENT OF THE "WARTY ULCERS OF MARJOLIN," BY MEANS OF THE CHLORIDE OF ZINC.

By Dr. H. Fearnside, Physician to the Preston Dispensary.

In the May number of the Dublin Quarterly Journal of Med. Science, at the close of a valuable paper on the "Warty Ulcer of Marjolin," by Dr. Robert Smith, there occurs the following passage:—"Were I to attempt the cure of the disease by caustic, I would feel inclined to place the most reliance upon the chloride of zinc, the efficacy of which in destroying cutaneous cancer has been highly extolled by Dr. Canquoin, of Paris, and likewise by Dr. Ure.

[Dr. Fearnside proceeds to describe the case which fell under his care. His patient was a large unwieldy man, having the aspect of a man accustomed to indulge in malt liquor. About nine years previously he had sustained a severe injury in the front of his right leg. Inflammation and a swelling ensued the size of a pullet's egg, which underwent little change for some years. But 10 or 12 months prior to his coming under Dr. Fearnside, pain was felt in the tumour, which acquired a dark red colour, the skin covering it being indurated and uneven, and the discharge thin, fetid, and often bloody. Dr. Fearnside continues:]

When I first saw him, the morbid growth presented the following characters;—From the centre of the front of the right leg, occupying a space of about three inches in diameter, there sprung a dark grey substance, which projected at least two-thirds of an inch above the surrounding skin. Its surface had a granular appearance—at first view not unlike the head of a cauliflower; on closer examination, it was seen that this was occasioned by the prominent extremities of coarse fibres which arose from the base of the ulcer, and were collected into masses, separated from each other by deep fissures. The margin of the sore was thickened, elevated, and possessed little or no connection with the fibrous structure above described: the surrounding integument had undergone considerable warty induration and discolouration. A thin ichorous discharge proceeded from the part; the pain experienced was not violent; there was no enlargement of the popliteal or inguinal glands. He complained of being weakened by repeated loss of blood, but his health was otherwise good. He had been previously under the care of one or two medical men, and had been advised to submit to amputation of the leg, on the supposition that the disease was fungus hematodes.

He was seen with me by my friend Mr. Noble, who considered the case a favourable one for the employment of the chloride of zinc; and, accordingly, it was determined to attempt the cure of the disease on the plan recommended by Mr. Alexander Ure.—(*Med. Gaz.*, *vol.* xvii, *p.* 391.)

On its first application, the remedy was mixed with flour. (Canquoin's formula.) But little pain was occasioned by it, and the resulting slough was not deep. When it was next employed, it was blended with pure sulphate of lime, as proposed by Mr. Ure. The whole of the morbid growth was covered to the depth of a third of an inch with a paste composed of one part of chloride of zinc and two parts of sulphate of lime. The application gave rise to severe pain, which was only partially under the control of opium. At the expiration of four days an extensive and deep slough was produced, which separated in the course of the ensuing week or ten days. The greater part of the sore was then covered with healthy-looking granulations; but to get rid of two or three small masses of whitish semi-cartilaginous substance, as well as to overcome the indurated condition of the margin of the ulcer, it was requisite again to have recourse to the caustic paste. The subsequent progress of the case was, upon the whole, highly satisfactory. No hemorrhage ensued after the first complete application of the chloride of zinc. In the course of a month small florid granulations had arisen to the level of the adjoining surface, and cicatrization commenced. The complete healing of the sore was delayed for some time by the patient's imprudence; for, considering himself well, he could not be induced to submit longer to regular treatment. After the lapse of three months, however, a small ulcer of the size of a shilling was all that remained of the apparently formidable disease; and he afterwards reported himself as cured.—*Med. Gazette, Sept.* 6, 1850, *p.* 411.

98.—MEDICINAL ACTION OF ARSENIC IN CUTANEOUS AND OTHER DISEASES.

By Thomas Hunt, Esq.

[Mr. Hunt asks, "Has arsenic ever been administered alone, alternately with other alteratives, in these diseases, for the purpose of comparing the results?" He replies, "It has."]

Cases 1, 2, 3.—Three cases of chronic eczema are reported in the *Medical Gazette* in the year 1841, under the care of Mr. Phillips, in the female ward of the St. Marylebone Infirmary. The patients were of the ages, respectively, of 38, 52, and 61. The two former presented at one period, on the hand and arm, the impeteginoid form of the disease. They were all treated first by tepid bathing every other night, and a drachm of sulphate of magnesia and ten minims of dilute sulphuric acid were administered three times a day for a month, with a certain, though small amount of benefit. Secondly, five minims of the tincture of cantharides were added to each dose. The relief now afforded to the younger patient was rapid and decided, and in six weeks she was discharged cured. In the other two cases no decided advantage was gained, although the dose was increased to fifteen minims thrice a day. Thirdly, both of these patients took five minims of the liquor potassæ arsenitis thrice a day. This produced on both cases a striking effect in ten days, and by the end of the fifth week the disease was gone; slight œdema of the lower limbs only remaining which soon yielded to bandaging. There is no room for doubting the efficiency of arsenic in these cases, else I could adduce from my own notebook, fifty cases equally conclusive, in which a chronic disease of the skin has been proof against the cantharides, the mineral acids, alkalies, iodine, tar, and other remedies of acknowledged power, and yet has yielded to arsenic. As I have already published many of these cases in my treatise on diseases of the skin, the above may suffice as the result of the experiment of substituting arsenic for another medicine of acknowledged power.

But perhaps the experiment of administering the medicine for a time, and then withholding it, leaving the case to nature, and afterwards resuming the use of the medicine, would be, to some minds, more satisfactory than any other mode of testing its therapeutical powers. This experiment, I have seen so frequently tried, and with such generally uniform results, that I consider the power of arsenic over cutaneous disease as well established as the action of any alterative remedy—perhaps better. The following cases are in point. In some of them the dose was reduced, and in others the medicine was wholly suspended for a time, then resumed.

Case 4.—*Prurigo Scroti.*—A gentleman had suffered for many months, and in an intolerable degree, from this distressing affliction; and nothing had given him any relief. The disease was sthenic and inflammatory in its character, as indicated by the pulse, although there was no local inflammation apparent. Accordingly, after bleeding and purging had reduced the pulse, arsenic was administered as follows:—

1836. April 16th.—Liq. arsenicalis, ♏v. ter in die.

22d.—No amendment. Liq. arsen. ♏vij. ter in die.

29th.—No relief, except from ablutions. Liq. arsen. ♏viij. ter in die.

May 1st.—Pruritus nearly gone; conjunctiva slightly inflamed. Reduce the dose to *five minims.*

9th.—The pruritus has returned in an annoying degree. Liq. arsen. mvij. ter in die.

17th.—No pruritus. Conjunctiva inflamed. Papulæ no longer visible. He considers himself cured. Discontinue the arsenic.

24th.—No return of the pruritus.

This case evidently yielded to arsenic, as proved by its obstinacy under a small dose, its improvement under an *increased* dose, its relapse when the dose was *reduced*, and its ultimate recovery on the full dose. The case is not adduced to illustrate the advantage of increasing the dose, for, generally speaking, this is bad practice; but to prove beyond doubt or cavil, the palpable control exercised by the medicine over the disease, which, to the best of my knowledge has never relapsed.

Case 5.—*Psoriasis.*—A young lady, who had been troubled with psoriasis for several years, reported that she had formerly taken arsenic for it, but "it did not agree with her." She afterwards tried cantharides, but without any permanent or very obvious benefit.

Nov. 21st, 1838.—Liq. arsenicalis, miv. ter in die.

May 12th, 1839.—Reports that the arsenic was of great service to her, but since she discontinued it the disease has returned as bad as ever. Resume the arsenic in four minim doses.

The disease was soon checked, but she again neglected the medicine, which she afterwards took, "off and on," for more than ten years, the disease invariably yielding most readily to every course, the eruption generally disappearing entirely after a few weeks, and returning as regularly when the medicine had been laid aside for a month or two. At length she was induced to take it with sufficient steadiness to justify hopes of the final subjugation of the disease.

Case 6.—*Lepra Vulgaris.*—A married lady, about twenty-five years of age had been troubled with lepra from infancy, and had found no benefit from treatment.

June 26th, 1845.—Extensive circular patches of lepra vulgaris on the arms and legs, especially the latter, and smaller patches over nearly the whole body. Liq. arsenicalis mv. ter in die.

July 12th.—Patches fading; conjunctiva tender. Reduce the dose to 4 minims.

20th.—Disease nearly well. Persist.

30th.—Quite well; no scales to be found, only brown stains. Persist.

Aug. 19th.—She has neglected her medicine for three weeks. The leprous patches are breaking out again "everywhere." Resume the arsenic.

Oct. 3d.—She has taken the medicine till now, and the disease has again disappeared. Persist.

Nov. 23d.—She has discontinued the arsenic and the spots are returning.

She now took the medicine more steadily, and the disease again disappeared. In the following summer a small patch made its appearance which got well under a few doses of arsenic, and I have not heard of her since that time.

Case 7.—*Pityriasis Capitis.*—A gentleman, aged 58, had a scaly disease of the scalp ten years ago, which was cured by the late Mr. Scott of Bromley (probably by arsenic).

Nov. 25th, 1847.—The disease has returned six months, and the patient can get no relief from medicine. There is an eruption of fine scales over the scalp, and on the whiskered part of the face. The rest of the body is free from disease. Liq. arsenicalis mv. ter in die.

Dec. 9th.—Eruption fading. Persist.

30th.—Nearly well. Persist.

Jan. 20th, 1848.—Conjunctivitis and catarrh. Reduce the dose to 3 minims.

27th.—Slight return of cutaneous irritation and scaliness. Take 4 minims for a dose.

March 9th.—Skin quite well.

In the following spring the disease returned, and was cured by arsenic in a very short time.

These cases are only adduced as samples of the direct-experiment mode of settling medical disputes; but it is right to observe, that the experiments were not tried empirically. It was first ascertained that the patient was in a condition favourable for the advantageous exhibition of arsenic. What that condition is was discovered by another series of experiments which will be detailed in the next paper; and this will explain the reason why there is so much discrepancy of opinion in the profession, as regards the use of arsenic, both with respect to its efficacy and safety.

The facts already stated, demonstrate (if there be anything demonstrable in medical science), that arsenic is not only a very important and useful agent in the treatment of chronic diseases of the skin, but that it has very frequently succeeded after other remedies have been fairly tried. The next paper will disclose other facts, showing how it may be administered effectually after having itself failed to do any good when exhibited indiscreetly on the one hand, or timidly on the other.

[Having endeavoured to demonstrate the efficiency of arsenical medicines in chronic diseases of the skin, Mr. Hunt proceeds to inquire into the conditions on which that efficiency depends. He considers first—]

Conditions unfavourable to the administration of arsenic.—1. A *febrile* state of the system, especially the sthenic form of pyrexia, indicated by the usual signs. If the pulse be frequent, and not easily compressed, the skin hot and dry, and the secretions scanty, and especially if there be chills and heat succeeding each other, arsenic will be found useless, or worse than useless; but, when this state of the system has been rectified, it may do good, as exemplified in the following case:—

Case 7.—Lepra Vulgaris.—A gentleman of full habit of body had suffered for about five years from numerous and extensive patches of lepra, occupying various regions of the body, and attended with intolerable pruritus, which had of late, materially disturbed his rest. Arsenic was tried repeatedly, but without the slightest benefit; the irritation seemed to increase under its use. It was, at length, observed, that the pulse was rapid and incompressible, the skin hot, the tongue foul, and the patient, on being questioned, complained of thirst and feverishness. He was now treated with salines and aperients, continuing the arsenic as before; but, at the end of a fortnight, there was no improvement, the pulse continuing full. A pint of blood was now taken from the arm, and in less than a week he was much better; the skin became cool, the pulse quiet, the tongue clean, and the leprous patches assumed a faded appearance. The arsenic was continued for another month, by which time all the scales had disappeared, and the skin had become smooth. The disease returned in the following spring, and again yielded to arsenic, but not until leeches, cathartics, and a low diet, had prepared the system for its use.

In this case, as in many others on record, a general principle is involved, which applies to the treatment of all diseases attended with sthenic inflammation, viz., to reduce the vascular action to the normal standard before attempting to carry out any special indication.

2. A condition of the circulation the very reverse of that which has just been described, has been known to present a limit to the salutary effect of arsenic, though by no means an objection to its use, as illustrated in the following case:—

Case 8.—Psoriasis Diffusa.—The skin of a girl of ten years of age exhibited extensive and irregular patches of a scaly disease which had proved obstinate under treatment; but on the administration of arsenic the disease rapidly improved up to a certain point. It then got as rapidly worse, and the child was shown to me. I found the pulse extremely weak, the appetite defective, and the patient languid and debilitated. The dose of the arsenic was reduced, and a grain of quinine, with some compound tincture of bark, was ordered to be taken twice a day; and with the return of appetite and vigour, which ensued under this treatment, the skin got speedily well.

3. A syphilitic taint in the system will render the disease incurable by arsenic, although in some cases it is beneficial in a degree.

Case 9.—Syphilitic Lepra.—A middle-aged married woman had a scaly eruption on the legs and thighs, which occasionally degenerated into fissures and ulcerations. There was a copper-coloured hue about the scales, and a dusky leaden appearance of the skin which had healed. A surgeon had treated it with arsenic with temporary benefit, not suspecting the existence of syphilis. Close inquiries, however, elicited, that although the husband was healthy, a sore on the right labium of the patient (the cicatrix of which was strongly marked) had resulted from connexion with a young man before her marriage, and this had been succeeded by an ulcerated throat. An energetic but short course of mercury was now administered, and in less than a month the skin was entirely free from disease.

4. The existence of organic visceral disease, as a complication of eruptions; an attack of diarrhœa, bronchitis, cynanche, coryza, or severe irritation in any mucous membrane: and certain conditions of the nervous system, especially those connected with dyspepsia; all these, and nearly all other disorders of the general system, generally contra-indicate the use of arsenic; but if the health can be restored by other means arsenic may aftewards be administered with advantage.

Case 10.—*Psoriasis complicated with dyspepsia.*—T. A., aged 22, had been from the age of seven years the subject of psoriasis, which in the spring and autumn was always much aggravated, extending over the greater portion of the whole surface of the body. He was likewise habitually troubled with headache, flatulency, and indigestion. He had been bled many times without advantage, and had taken arsenic in large doses for six months together. It made him sick, and he was consequently obliged to abandon its use, although the skin was in some degree benefitted by it. The compound decoction of aloes, together with the compound rhubarb pill, administered for a few days only, completely relieved his dyspeptic symptoms. Arsenic was then administered steadily for seven weeks, and at the end of that period the skin was perfectly well, a slight degree only of sickness having been complained of during the last week of the course; but this subsided on discontinuing the mineral.

That the conditions above described are decidedly unfavourable to the exhibition of arsenic might have been proved by a multitude of cases, but few only have been selected as satisfactory samples of the rest. To these proofs may be added the testimony of many of my respected correspondents, who severally use the following terms as descriptive of the conditions which have been found, in their experience, incompatible with the advantageous use of arsenic, viz.:—Unsound lungs, natural irritability of mucous membranes, plethoric and inflammatory states tonic condition of the system, sanguineous, temperament, inflammatory tendency, tendency to sudden nervous exhaustion from any cause, irritability of constitution, acute diseases, proneness to irritability of the circulative or assimilative system, eczema, mercuriale, head symptoms, organic disease.

Conversely, the conditions which have determined the respondents severally on the use of arsenic, or in other words, the indications for its exhibition, are comprised in the following terms, viz.:—The phlegmatic rather than the sanguine temperament; cachectic lax-fibred habits; when other medicines fail; in periodic diseases; debility; atonic state of the system; good general health; obstinacy of the disease; the presence of lepra; the chronic character of the disease; general pallor; slow circulation; general coldness; non-inflammatory condition; freedom from febrile or mucous irritation.

Mode of administration, dose, &c.—I. As arsenic is liable to irritate the stomach and bowels, and as this circumstance has been frequently considered a formidable objection to its use, it is important that it should be administered not on an empty stomach but rather with or after a meal. And there is another reason why this mode should be preferred. Dr. Golding Bird justly remarks, that as the elements of the food are absorbed by the lacteals and not by the veins; and as, on the other hand, the substances not forming part of the food are, when in solution, absorbed by the venous capillaries, arsenic or iron in solution, when taken on a meal, so as to mix with the food, will be almost entirely absorbed into the chyle by the lacteals; but if taken on an empty stomach the medicine will be chiefly absorbed by the venous capillaries, and enter the *portal* circulation. Now, as we wish the arsenic to enter the *general* circulation, it should be mixed with the food, or at least swallowed after a meal. The food present in the stomach not only dilutes the medicine, and thus preserves the mucous membrane from immediate contact with it, but in some measure provides for its direct transmission into the general circulation.

These propositions are so nearly self-evident, or at least so necessarily deducible from established physiological truths, as to require no cases for their demonstration.

II. Arsenic is a cumulative medicine, and therefore should never be administered in increasing doses; otherwise a sudden and sometimes an alarming development of its toxical effects will necessitate an entire suspension of the medicine. This is a most important point. Arsenic has been usually administered in increasing doses. It is directed in every work on the materia medica, and in every treatise on cutaneous diseases which have met the writer's eye, to be given in small doses *gradually increased* until some unpleasant effects become manifest, then to be *suspended for a time.*

A large majority of my seventy-five correspondents had been accustomed to administer arsenic in this way, and they record one or more of the following effects as the result of this method, viz:—"Conjunctivitis," "swelling of the limbs or features," "irritation of mucous membrane," "purging," "gastritis," "desquamation of cuticle," "general inflammatory state," "flushings," "headache," "exhaustion," "restless nights," "sinking" "giddiness," "palpitations," "mental agitation and alarm." On the other hand I have been accustomed, for many years, to administer arsenic differently. Beginning with five minims of Fowler's solution, three times a day, and continuing that dose steadily until the conjunctiva or tarsi became slightly affected; then reducing the dose again and again as the cumulative action became apparent in the state of the *tarsi*, I have very rarely observed any of the more formidable results in the above catalogue of symptoms. And it is remarkable, that every writer who recommends increasing the dose, also very properly advises an entire suspension of the medicine when toxical symptoms appear. The consequence of this suspension is, that the disease relapses, and proves "obstinate and intractable." Whereas, if the dose be moderate and uniform in the first instance, and reduced when the conjunctiva becomes slightly inflamed, there will be no necessity for suspending the medicine at all; and by steady perseverance, we may rely upon the arsenic wearing out the disease without injuring the health; and, in fact, the health is generally found to improve under its influence.

The theory on which this practice is founded is very simple. If all subjects were equally susceptible of the action of the medicine it would be not only safe but advantageous to begin with at least twenty or thirty drops of Fowler's solution for a dose, this being the average dose borne without injury. But as we do not know what a patient will bear, different individuals varying considerably in their tolerance of arsenic, we begin with a moderate dose, say five minims three times a day. Now, a person taking this dose three times a day, will have taken in ten days, just 150 minims, and the effect of this on his system will be the same as that of taking 150 minims (minus the quantity excreted in ten days) at a dose. That this hypothesis is very near the truth I have demonstrated in hundreds of cases.

Case 11.—Mr. Girdwood relates that a patient took two drachms of Fowler's solution in twenty-four hours by mistake. It cured the ague for which it was administered (a tertian), and it had no detrimental effect.

Case 12.—A lady, by mistake, took forty minims of Fowler's solution three times a day for several days: she felt no inconvenience for the first two days, but on the third and subsequent days her nerves became irritable, and in less than a week she was visited with trembling of the limbs, dimness of sight, sensations of exhaustion, and other affections of the nervous system.

Case 13.—A lady of delicate habit took, for the cure of a cutaneous eruption, five minims of Fowler's solution three times a day for three days; in all, forty-five minims. She then complained of a general tremor of the limbs, and inflammation of the tarsi.

Case 14.—One of my correspondents administered ten minims of the solution three times a day for two or three months without the slightest sensible effect being produced, either local or general.

These four cases show that the susceptibility of arsenic varies much in different subjects; that where the susceptibility is not great a dose of two drachms of the solution can be borne about as well in one dose as in twenty; and that where the susceptibility is very great, forty or fifty minims given in divided doses for three or four consecutive days will produce an effect on the system, clearly cumulative. It is not necessary to say another word in favour of this mode of administration, since it is evident that both the safety and success of the medicine will mainly depend upon it.—*Med. Times, Aug.* 10, *p.* 140, *and Sept.* 14, 1850, *p.* 279.

99. TREATMENT OF LUPUS.

By Dr. Thomson. From a practical treatise 'On Diseases affecting the Skin.'

In the treatment of lupus, Dr. Thomson was remarkably successful; and we believe that we are only doing an act of justice to his memory, in giving the following sketch of the plan adopted by him in the management of this very formidable and intractable disease.

He used but few local applications, and relied chiefly on three medicines, viz., iron, iodine, and arsenic, together with biniodide of mercury, and the occasional use of cod liver oil and quinine. When a patient first came under treatment, if the general health were at all lowered, and if there were any anemic symptoms, cod-liver oil and iodide of iron were given for ten or fourteen days, the diet being at the same time nutritious, and other means being adopted to invigorate the system. Afterwards, the alterative treatment commenced with the administration of the biniodide of arsenic in doses of one twelfth of a grain; and Dr. Thomson considered it the safest plan to adhere to these small doses, as in large ones it often produces gastrodynia, and when this has once occurred, the stomach is extremely intolerant afterwards of the smallest dose. If any gastrodynia came on, the medicine was at once left off, and opium and hydrocyanic acid were administered. Conium was after found useful, and was frequently combined with the biniodide. If the latter however, could not be born in any form, the liquor potassæ arsenitis, of the London pharmacopœia, was given in small doses of from four to eight minims, and iodine was rubbed in over the healthy skin to promote absorption. Although local caustic applications were very little employed by Dr. Thomson, yet he occasionally applied the strong nitric acid to the edges of the ulcer, or a strong solution of nitrate of silver (ʒij or ʒiij to ℥j of water) over the tubercles, and subsequently acetate of lead-wash to lessen the temporary heat and swelling which followed. If unhealthy, pale, fungous granulations arose, an ointment of iodide of sulphur, or a very weak ointment of the biniodide of arsenic, or of either of the iodides of mercury, was employed. Four cases are recorded in the work, in which the above treatment was adopted, and with perfect success in every instance.—*London Journal of Med. Science, September,* 1850, *p.* 847.

100.—ULCER OF THE LEG, TREATED BY THE INTERNAL USE OF TURPENTINE.

Reported by W. Hamilton, Esq., House-Surgeon to Charing-Cross Hospital.

[The following case illustrates the observations made by Mr. Hancock on the great utility of turpentine in some forms of ulcer of the legs, especially depending on debility, with want of action in the system, circulation languid, wound sluggish, with smooth surface, and of a greenish foul appearance, without granulations. E. B., a laundress, who had never menstruated but at the monthly periods, had coughed up and vomited blood, was admitted with an ulcer on the leg, nearly five inches broad, extending almost completely round

the limb. It was in the condition before mentioned, and accompanied by excessive pain. Her health was extremely delicate—she had wasted away—lost appetite—was subjected to night sweats, with a terrible cough.]

Under these circumstances, Mr. Hancock, under whose care she was placed, commenced giving her the cod-liver oil; but it caused so much nausea it had to be discontinued; and on the second day the turpentine mixture was ordered as follows:—

℞. Sp. terebinth., ʒvi.; pulv. acaciæ, ʒvi.; aq. menth. pip. ft., mist. ℥viii.; cap. ℥i. ter die.

At the same time she had a generous diet, with a daily allowance of wine. Linseed-meal poultices were applied to the leg for the first day or two; but afterwards, throughout the case, water-dressing, and the leg bandaged up to the knee.

Under this treatment she continued to improve daily, the wound became covered with small regular granulations, secreting good healthy pus. Her appetite improved, the menses returned, and with it ceased the expectoration of blood. She was discharged, with the leg quite healed, June 15, just three months after her admission.—*Med. Times, July* 6, 1850, *p.* 12.

101.—TREATMENT OF VARICOSE ULCER AT ST. THOMAS'S HOSPITAL.

Reported by Dr. Charles Kidd.

[The healing of an ulcer of the lower extremities, though apparently simple, is one of those difficult problems which so often test the patience, as well as exercise the skill of the surgeon; and among these the varicose ulcer holds a prominent position. As an example of this, Dr. Kidd describes the following cases. The first was that of Henry Cooper, aged 36, who came into the hospital July 26, having been seven weeks ill with an old sore leg, all the side of the ankle being now one large ulcer with varicose veins.]

Having undergone much of the usual preliminary treatment before coming into the hospital, in addition to purgative medicines having had ointments and lotions, &c., it was thought advisable to check if possible the varicose condition of the vessels. The old plan of taking up the vein and tying it, always leading to phlebitis, was thought not advisable. A caustic issue along the chief vein, between the ulcer and the heart, a plan tried with the best results previously in this hospital, was adopted, and has proved most satisfactory. It has quite astonished the poor man himself, who hopes to get back in a few days to his employment. The potassa fusa has of course produced a large eschar, to which he has applied a poultice. The ulcer is carefully strapped and bandaged, as well described by Mr. Chapman, and rest with the horizontal position enjoined.

August 4.—The man seems quite rejoiced at the sudden improvement in his health, and the healing up of his old ulcer. The issue is not so troublesome to-day as it has been; poultice to be continued to it; plaster and strapping to be renewed.

6th.—Ulcer visibly healing; the issue a little sore. His general health and strength have undergone the most marked improvement. The most remarkable point, however, in the case is the quickness with which healthy granulations in the old ulcer have sprung up.

Case 2.—Jeremiah Crawley, aged 40, admitted July 10, is the counterpart of the foregoing case; he has been laid up with a bad leg for seven months, during which he has been able to work very little, but has at last decided on coming into hospital. He has large varicose veins, and the usual indolent ulceration near the ankle, on the inside of the leg, with large indurated callous edges. His general health seems excellent.

He was ordered the usual house medicine, to have the leg carefully strapped and bandaged, and the *potassa fusa* rubbed along over the site of the larger vein near the inside of the knee; to give the limb as much rest as possible. This man, too, has been going on most favourably; the ulcer is just healed upon, and the varicose condition of the veins is quite removed. He goes out in a few days.

The *modus operandi* of the caustic in these cases is, perhaps, open to a little speculation. Mr. Green seems to think it destroys the superficial varicose veins by interrupting the current of blood in them, and forcing it into the deeper veins. If we succeed in checking this varicose condition of the vessels under the skin, the healing of the ulcer follows as a matter of consequence; we have possibly the counter-irritant effect of the caustic also. The great practical fact, however, for our notice is, that it is the best mode yet tried, and the safest, perhaps, for healing those very troublesome and very unsatisfactory ulcers. It is less dangerous than any of the plans recommended for interfering directly with the vein, and I am not quite sure but it is simpler, and more grateful to the patient.

Taking up the saphena vein was one time tried in these cases, but is now very properly discontinued. The cutting out of a piece of the vessel seems not less formidable, and is equally dangerous. The sub-cutaneous incision of the vein, as practised by Sir B. Brodie, has been tried also; but his own very clear account of his cases would not lead us to put much faith in the operation. Then we have *puncture* of the vein, of which little can be said that is favourable,—*cutting* the vein, piercing it with needles, &c. The most simple practice, and certainly that liable to injure the constitution the least, is the use of the caustic potash. Of course, before having recourse even to this, it would be advisable to give a fair trial to the simple use of a well-applied bandage, with water-dressings or the adhesive straps, according to the exact condition of the ulcer. If evidently inflamed, as the ulcers mostly are when first seen, the patient should be kept in bed, fomentations, and perhaps leeches, tried.

When the inflammation is got under, the ulcer is to be covered with a little soft charpie; the varicose condition counteracted, as much as possible, by a skilfully applied bandage, affording equable support from the toes to the knee. Sticking-plaster, in single straps, (like an ordinary Scultetus's bandage,) or after the plan of Mr. Chapman, is, perhaps, preferable to the classical spirals of Baynton's method. Great care is necessary in the application of the bandages and straps, as well as that of the laced stocking; the latter should be such as not to retain heat too much,—some light fabric, calico, stocking-web, or nankeen being the best. The caustic potash, I need scarcely say, was originally suggested by Bonnet, and in this country first tried, perhaps, by Mayo. The chief objection against it is that, more than once urged, that the slough takes a long time to separate; and when one cluster of veins is lessened in size another cluster appears. The mere fact of its being almost exclusively used in this and other hospitals would lead us, however, to doubt if there is much practical force in the objection. The introduction of a thread through the vein to produce a clot has been suggested where the caustic has failed. A good plan, also, is to thrust a pin under the large vein and raise it, a second pin being thrust through it crosswise, a thread of silk twisted round both externally. This obviously will produce a clot, and should be had recourse to after the simpler means we have alluded to have failed. Some ordinary phlegmonous inflammation will follow, with swelling of the inguinal glands, not of very great moment if watched. In old people any operation of veins is dangerous. In young patients with bad varicose ulcers, after the caustic has failed, the pins are worthy of a trial, and should at least precede the more formidable and more dangerous operation—that of tying the vein. Every practical surgeon must at once recognise the difficulty of giving any general rules: some patients not bearing the slightest puncture or cut, and others as commonly escaping after the most formidable operations. In all we have, however, a safe resource in the potassa fusa, as we have just described.—*Med. Times, Sept.* 7, 1850, *p.* 255.

102.—REMOVAL OF DEFORMITY AFTER THE CICATRIZATION OF A WOUND CAUSED BY A BURN.

By W. Fergusson, Esq.

[The removal of this deformity by manual operation is well evidenced in the following interesting case, under Mr. Fergusson.]

The patient, who was a little girl about ten years of age, had been burned some time ago in the left arm. The injury affected the parts just in the flexure of the elbow-joint. It is probable that so much precaution as was necessary in these cases was not taken; for as cicatrization had ensued, the elbow became contracted by the firm puckering of the integuments. In order to set this free, Mr. Fergusson performed the following operation:—By two nearly parallel incisions he included the old cicatrix, which was about three inches in length, and dissected it cleanly away from the tissues beneath. Another incision, at right angles to the former, about an inch in length, was then made, for the purpose of taking off the tension of the parts, and the edges of the wound were brought lightly together with thin sutures. This operation, although simple in appearance, requires great neatness and care in its execution; and much precaution is necessary in the after-treatment of such cases, as there is always a very great disposition in the parts to contract after they have been liberated. Mr. Fergusson stated that the plan he had just adopted was very similar to the one recommended by Sir James Earle, and that it was the most likely to be successful in the removal of such contractions.—*London Med. Gazette, Aug.* 2, 1850, *p.* 211.

103.—EFFECTS OF A BREAD AND MILK DIET ON A SUPPOSED MALIGNANT TUMOUR OF EIGHT YEARS STANDING.

By Dr. Bowditch.

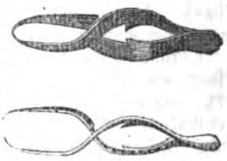
This case occurred in the person of Dr. Twitchell, one of the most celebrated medical practitioners in New England. Carcinoma had prevailed in his family, and during his studentship he had suffered first from dyspepsia, and then from severe asthma, which entirely left him after he had abandoned the use of meat, and confined himself to a vegetable diet on account of an acne with which he was troubled. After nine years of such abstinence, he gradually resumed the moderate use of meat. The local disease in question commenced about eight or ten years since, as a small hard tumour at the inner angle of the eye, which slowly but gradually enlarged so as to become very conspicuous. The greater part was excised, but the wound did not heal, and another operation, followed by the use of nitrate of silver, was performed. Eventually the ulcer which resulted assumed a decidedly malignant aspect, and the general opinion of the eminent men he consulted at the meeting of the Medical Association of Philadelphia, in May, 1847, was that the disease was of a very serious character. A variety of local applications having been tried, Dr. Twitchell, starting from the theory that malignant disease arose from the taking too much carbon into the system, resolved to limit himself to a bread and milk diet, and to this he henceforth strictly adhered. He took from four to six ounces of cream, or the richest milk, and as much white or brown bread, three times daily. The immediate results were a cessation of the pain, a dimunition of the discharge, and an arrest of the spread of the ulcer—this eventually diminishing, and then altogether disappearing. When Dr. Bowditch saw him, August, 1849, no difference could be discerned in the angles of the two eyes, unless by a person already aware of the former existence of the ulcer, who would then perceive a small soft cicatrix. A perfect cure of what all thought to be a malignant disease of ten years' duration had thus been accomplished by this diet, commenced when the patient was 68 years of age. Under its influence too, Dr. Twitchell found himself less irritable than heretofore, while, on account of a tendency to corpulence under its use, he was at one time obliged to reduce the quantity. His strength continued as great, though having a large practice to attend to; his digestion good and his respiration more free. To the eye he had the appearance of a hale, robust man, in perfect health.—*Am. Journ. Med. Sc.*

By an obituary notice in the same journal. we perceive that Dr. Twitchell died in May, 1850; but, as that notice is contributed by another hand, there is no account of his health since Dr. Bowditch's communication in November, 1849, nor is the cause of his death stated.—*Brit. and For. Med. Chirurg. Review, Oct.*, 1850, *p.* 553.

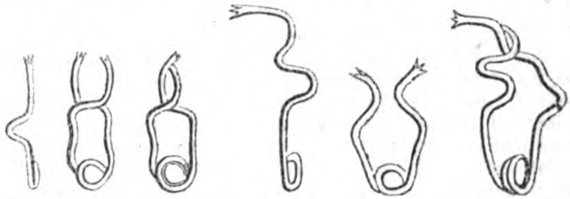
104.—UNION OF WOUNDS.

By M. Vidal.

[At various periods in the history of surgery other means besides the employment of adhesive plasters and sutures have been employed to promote the union of wounds, and M. Vidal finding that the wounds from the operation of phymosis completely healed in twenty-four hours, he had made for him a small pair of forceps to keep the edges of the wound in contact, without its actually perforating the integuments.]



In this little forceps, from the manner in which the blades cross each other, the points are constantly kept in apposition, until a slight pressure is made at the part where both are united. M. Vidal has proposed the name of "serres-fines" for these little instruments, which in his opinion are destined completely to supplant the ligature and the use of adhesive plaster. The number of them to be employed in any particular case will depend on the extent of the wound. "It may be necessary," says M. Vidal, "to apply as many as sixteen." The period for which this application is to be continued, does not in the opinion of this surgeon, exceed twenty-four hours; and he states that the re-union is accomplished as completely after eight as after twenty-four hours. They can be removed with facility, it being always remembered that they open or close by a mechanism exactly the opposite to that of the ordinary forceps. In their removal they present many advantages over the suture, occasioning neither pain, bleeding, nor traction. Their employment is not limited to wounds of the prepuce. The inventor has himself used them for the union of a wound of the temporal region. M. Danyau gives a successful case of their employment in rupture of the perineum, of twelve hours' standing, in which union was accomplished in sixty-five hours. Their application has been proposed by Vidal, in the case of varices, with the view of arresting the current of blood, without injury to the integument or the vein itself. In a subsequent communication to the 'Bulletin de Thérapeutique,' the author has proposed a modification of his *serres-fines*, by which greater simplicity, and, what is more important, lightness, are combined. They are formed of silver wire, of the strength of an ordinary pin, and are easily made: the above figures exhibit several varieties of them.—*Dublin Quarterly Journal of Med. Science, August*, 1850, *p.* 119.



105.—COLLODION IN ERYSIPELAS.

Under the care of Mr. Luke, at the London Hospital.

We have to direct the attention of our readers to a new topical application in cases of erysipelas, the beneficial effects of which are now placed beyond a doubt. The substance in question is collodion, which has been found so serviceable in many respects, not the least being its capability of arresting the hemorrhage from leech-bites in children. Mr. Luke considers that collodion applied to the inflamed surface in erysipelas, acts by compressing the capillaries of the skin, and thereby contributes materially in relieving those vessels.

He was induced to make use of this liquid in the manner described, on the suggestion of Mr. Bird, the author of the Jacksonian Essay on Erysipelas, which lately gained the prize: and Mr. Luke has had occasion to be highly satisfied with the results he has obtained, both in hospital and private practice. Several cases of erysipelas have been thus treated in Mr. Luke's wards, it will, however, be sufficient to report one of these, kindly furnished by Mr. Peete, to show how fully the application answers the purpose.

Amelia S., forty years of age, was admitted under the care of Mr. Luke, June 1, 1850, with acute inflammation of the neck, which, a week after admission, ended in abscess. This was opened, a large quantity of pus evacuated, and the patient went on very favourably for a week, when an inflammation of an erysipelatous character was observed to have invaded the upper part of the back. It extended from the neck to the first lumbar vertebra, including both scapulæ, and the inflammation had a distinctly defined margin.

Collodion was immediately applied by means of the finger to the whole surface, and to some little distance beyond it. The skin was much puckered by this measure, and the patient complained of the constringent effects of the collodion. Mr. Luke ordered the patient to have an allowance of wine, as she was rather depressed. (We may here state that most cases of erysipelas are treated in this hospital by large doses of stimulants, as brandy, wine, &c., &c.; and that this line of practice is generally followed by very favourable results. The type of the erysipelatous affection in charitable institutions is commonly of a very debilitated kind, and this fact would partially explain the necessity of supporting the patients by the stimulants just mentioned.)

In the case before us, the collodion was repeated on the following day, and on the third, the erysipelas had entirely subsided in the part where it had first made its appearance. It, however, broke out afresh about the nose, lips, and eyelids; and a little lower down it extended from the edge of the wound made by the lancet to the whole chest, implicating both mammæ. Patient complained of violent pain in her head; her eyelids were closed; and she had delirium at intervals, particularly at night. The collodion was applied, in the manner described above, to the whole chest and face; the hair was removed, and the head kept cool with a spirit lotion. These topical measures, combined with the administration of stimulants, proved extremely beneficial, and the patient improved rapidly. The collodion was applied daily for a week, and on the 24th of June, ten days after the first onset of the erysipelas, the inflammation had quite disappeared, and the patient was declared convalescent.

A male patient was lately treated in the same manner for erysipelas, and the successful results were very quickly obtained. Mr. Luke has used the collodion very frequently in private practice: in one instance it was placed upon a young lady's face, excepting a small portion of the cheek, from which it peeled off. This part, soon afterwards, begun to look redder, and projected beyond the surface of the surrounding skin, being, in some degree, herniated. This circumstance showed very clearly how great must have been the pressure which was exercised by the fluid. Thus it would appear that the collodion fulfils two indications of an important kind: it protects the inflamed surface from the contact of the air, and it contributes, by the pressure it effects, in driving the blood from the distended capillaries.—*Lancet, July* 13, 1850, *p.* 60.

106.—MEDICATED SOAPS FOR THE TREATMENT OF SKIN DISEASES.

By Sir H. Marsh.

Sir H. Marsh recommends the following in the more chronic forms of skin disease, as chronic eczema, psoriasis, &c.:—

Sulphur Soap.—Take of white Windsor soap two ounces, spirit of wine, coloured with alkanet root, one fluid drachm. Pound the soap well in a marble mortar, so as effectually to get rid of all lumps; add the spirit, and beat into a uniform paste; then add sublimed sulphur two drachms, otto of rose ten drops—beat all well together.

White Precipitate Soap is made precisely as the sulphur soap, substituting ammoniated submuriate of mercury for the sulphur.

Red Precipitate Soap.—Take of white Windsor soap two ounces, rectified spirit of wine one fluid drachm; pound the soap well in a marble mortar until all lumps have disappeared; add the spirit, and beat into a uniform paste; then add precipitated red oxide of mercury one drachm, otto of rose six drops; beat all well together.

Corrosive Sublimate Soap.—Take of white Windsor soap two ounces, spirit of wine one fluid drachm, corrosive sublimate one scruple; pound the soap well in a marble mortar until all lumps have disappeared; add the corrosive sublimate, previously reduced to a fine powder and rubbed in a separate mortar, with the spirit. Beat all into a uniform paste, adding six drops of otto of rose.

Sir H. Marsh states that the only forms of cutaneous disease that admit of the application of these soaps are those which either have passed from the acute into the chronic stage, or have not been at any period peculiarly irritable and tender; at the same time, he has met with several cases in which the tender surfaces, at first intolerant, became subsequently inured to them; and, after a little perseverance, the patients began to speak highly of their soothing and beneficial effects.—*Dublin Med. Press, Sept.* 4, 1850.—*Prov. Med. and Surg. Journal, Oct.* 16, 1850, *p.* 581.

SYPHILTIC DISEASES.

107.—TREATMENT OF SECONDARY CONSTITUTIONAL SYPHILIS.

By Langston Parker, Esq., Birmingham.

[The intention of Mr. Parker's work is to bring under the notice of the profession the method which he employs in the cure of constitutional venereal diseases—requiring a small amount of internal medicine, conducted without risk, and in a vast majority of instances with certainty of success, and permanent cure in a short time. It is denominated the mercurial vapour bath, "consisting in surrounding the patient with an atmosphere of mercurial vapour in a moist state," and having, according to Mr. Parker, all the advantages, and none of the disadvantages, of the best conducted ordinary modes of mercurial treatment. The mode of applying it is as follows:—

The patient is placed on a chair, and covered with an oil cloth lined with flannel, which is supported by a proper frame work. Under the chair are placed a copper bath, containing water, and a metal plate, on which is placed from one to three drachms of the bisulphuret of mercury, or the same quantity of the grey oxide, or the binoxide. Under each of these is a spirit lamp. The patient is thus exposed to the influence of three agents,—heated air, common steam, and the vapour of mercury, which is thus applied to the whole surface of the body in a moist state. After the patient has remained in the bath from five to ten minutes, perspiration generally commences; and, by the end of twenty or thirty minutes, beyond which I do not prolong the bath, it is generally excessive. The lamps are now removed, and the temperature gradually allowed to sink; when the patient has become moderately cool the coverings are removed, and the body rubbed dry. The patient is suffered to repose in an arm-chair for a short time, during which he drinks a cup of warm decoction of guaiacum, sweetened with syrup of sarsaparilla.

[Very little medicine is required to be administered internally during the use of the baths, and Mr. Parker states, "I never saw the health of the most delicate patient, either male or female, injured under the plan I recommend," and "I have rarely seen a disease that has not been cured without a relapse." This plan of treatment being introduced by a surgeon of Mr. Parker's standing, renders it imperatively the duty of the profession to give it a fair and extended trial.]—*Med. Gazette, June* 21, 1850, *p.* 1082.

108.—PRESENT CONDITION AND TREATMENT OF VENEREAL DISEASE IN PARIS.

By William Acton, Esq.

[Mr. Acton commences by stating, that although the medical journals every now and then describe any new plan of treatment M. Ricord may adopt in venereal diseases, yet that they give but an imperfect idea of the progress which medical science is making. He says:]

The first thing which strikes the most casual observer, on looking over the cases, is the large proportions of indurated chancres—thirty-three cases in the wards at one time. Here the student may study induration in all its forms. The frequency of this symptom in the wards depends upon M. Ricord admitting by preference, as patients, those who suffer under this form of chancre. Like all writers on syphilis, he lays the greatest stress on this symptom; but differing from all his predecessors, he does not consider all hardness attending a chancre to be induration. To diagnose this true symptom of syphilis, he looks for, and points out to the pupils, the enlargement of the glands in the groins, occurring a few days after the induration on the penis. These buboes rarely suppurate; when matter forms it is the result of inflammation superadded to the disease, and is an accident, whereas the enlargement in the groin is a constant attendant upon indurated chancre. When this symptom is not to be detected, he often keeps the patient in the wards, to show that the false ulceration will subside of itself, and secondary symptoms not occur.

I said above that you may study, in these thirty-three cases of indurated chancre, the disease in all its varied consequences. In by far the majority of cases, secondary symptoms had already appeared; and on reference to the table, twenty-one cases are noted down in which secondary symptoms were the most prominent feature; here indurated chancre had previously existed. In these cases of constitutional syphilis, M. Ricord dwells particularly on a character not noticed by previous writers—namely, enlargement of the glands at the back of the neck, a very constant occurrence in secondary symptoms, and one that comes on early—say five weeks—after general contamination of the system. The treatment of all these cases consists in ordering the mineral, in the form of proto-ioduret of mercury, a preparation he almost exclusively gives, but one which in England I have been unable to prescribe, as the same pills which patients bring from Paris act too violently on the bowels in this country, inducing colic and diarrhœa,—consequences rarely seen in Paris, and which we must attribute to climate and difference in diet in the two capitals. I need not here dwell on the long period mercury, he thinks, must be given in cases of indurated chancre or secondary symptoms, and be continued even after their disappearance; three or six months' persistence will scarcely be long enough to eradicate the syphilitic diathesis, and prevent relapses when the constitution has been once infected. All his further experience has only convinced the professor of the 'Hôpital du Midi' of the correctness of his ideas long since given to the public, but he now further assists their action by prescribing more frequently.

Fumigations.—This mode of giving mercury is so rarely followed in London, at the present day, that perhaps few of my readers are aware of the means employed.

The patient is placed naked in a box, his head being the only part exposed to the air. This box is heated by a furnace below, in which the bisulphuret of mercury is placed, in proportions of three drachms. The heat soon volatilizes the mineral, and the fumes come in contact with the skin. The patient is allowed to remain twenty minutes in the box, and a tumblerful of water is given him. In a few minutes perspiration comes on, and the patient is then taken out, and well rubbed down; and the fumigation may be repeated twice a week for a month or six weeks, according to circumstances. In old chronic affections which do not yield to mercury, given internally, the most marvellous effects are often produced, and I have seen cases (resisting all other treatment) get rapidly well under this plan; and I would recommend a trial to my professional brethren in the numerous instances that come before them of obstinate complaints. I am, however, by no means convinced of its general application, or that it is likely to supersede the mineral, given internally. It has been said that patients may employ fumigations, and yet pursue their ordinary occupations. One case that has lately come under my notice induces me to recommend that patients, after employing the cinnabar, should not expose themselves to the open air. I fear, likewise, that in country practice the use of it must be circumscribed. A fixed apparatus will be necessary, as the volatilization of the mercury is difficult, in consequence of the great quantity of heat required. The ordinary spirit lamp appears insufficient. I lately placed a patient in a vapour-bath, and after weighing three drachms of the cinnabar, placed it on the plate, over a strong spirit-lamp. In twenty minutes the substance had only lost one scruple in weight, independently of waste, thus showing that this is a very imperfect way of volatilizing the mercury, the vapour of which is so heavy that it will not rise more than one foot, unless carried up by a strong current of air. These peculiarities explain why fumigations have fallen into disuse, as the proper means of application are not always at hand.

Tertiary Symptoms may be seen in the wards in all their variety; and I noticed one which will form the subject of a separate communication—viz., of amaurosis, depending upon disease of the sphenoid bone. Suffice it, at present, to say that iodide of potash is our sheet-anchor, given in *large doses*. It is a very general belief in London, among our leading surgeons, that all the good that iodide of potash can do, will accrue if three or five grains be given, three times a day; more than that I am daily told, will do harm, or if more be given with impunity, the article is spurious. I do not wish to underrate the good effects of the salt often resulting from small doses, but I am as equally convinced that large doses may be given with impunity. I lately had a gentleman from Scotland under my care, who took the remedy in such quantities that he purchased it by the half-pound, and yet it was a genuine article; but I will go further than this, and assert, from a pretty large experience of its effects, that small doses do not do any or the slightest good in many instances. I have now under my care a patient with affection of the nose, and destruction of the ossa nasi, who had been taking small doses of iodide of potash for many months, under a late lamented surgeon, and the disease remained pretty nearly in *statu quo*. She came under my care, and the affection is now on the point of complete recovery under increased doses.

I met Mr. Wallace in consultation a short time since, in reference to a case of tertiary symptoms of the nose and brow, which iodine had relieved, but not cured, although taken in these small doses by the direction of another surgeon for nine months; here the salt had been obliged to be left off, because iodic intoxication was said to have been produced, together with symptoms of affection of the brain. Now, in these instances, time, rather than the dose, was in fault, and the surgeon who entertains these ideas scruples not to prescribe iodide of potash for years, rather than give it in larger doses.

I saw, with Mr. Vickers, a gentleman who has now entirely recovered, to whom we gave large doses of iodide of potash with bitters, yet small doses had failed in curing him, although given for long periods under the advice of other practitioners. I mention these cases because prejudices exist against the employment of the remedy, whereas, in France, Ricord gives it in anything but homœopathic doses, and with the most signal success.

Phagedenic Chancre.—At the time I visited the wards, only two cases existed of this disease, but generally it is much more frequently met with. Under this head may be included all those anomalous sores met with in London, or elsewhere, which are classed as irritable chancres, occurring in bad constitutions, indisposed to heal, spreading, instead of healing kindly, and causing the greatest annoyance to both surgeon and patient. In consultation practice in London, these are the cases I am most frequently consulted about to sanction the use of mercury. All sorts of washes have been used, caustic has been applied, but without avail, and the case is getting worse. In all such instances iron is the remedy, and its effects are perfectly magical. I need not say that mercury aggravates such cases. Of all preparations, the tartrate of iron is best, given in the following manner:—potassio tartrate of iron, one ounce; water six ounces. Mix. Two table-spoonsful three times a-day.

M. Ricord largely employs it, and prescribes it now, even in the treatment of simple cases of chancre: he uses it, likewise, as a local application, as well as an internal remedy.

Chronic Catarrh of the Bladder.—Ricord now uses caustic injections into the viscus itself. Having emptied the organ of urine, he passes a gum-elastic catheter, and then, with a glass syringe, throws the injection into the bladder, and repeats it, according to circumstances, every three or four or six days. There is some pain and irritation set up; the urine becomes a little bloody, but the ropy secretion soon ceases. The different preparations of turpentine are given, and I saw four cases in their different stages. He has not met with any ill consequences of the treatment, although the injections used are composed of nitrate of silver, two drachms; distilled water, four ounces. Mix for an injection.

Strictures.—On the day I took notes of the cases, only three instances of stricture of the urethra presented themselves in M. Ricord's wards, and one of urinary fistulæ. The whole of these were serious examples of their respective diseases, and formed the subject of a clinical lecture. I am happy to say, that the eminent professor of the Hôpital du Midi corroborated many of the opinions I expressed during the last winter, on the subject of treatment. In the ordinary cases, he employs simple dilatation by means of conical gum-elastic bougies, with a little olive-shaped point. When retraction takes place, the case is treated by incision with instruments passed down the urethra, and he has lately introduced several modifications in the shape of the instruments with which the stricture is to be incised. Nitrate of silver is rarely employed in stricture; and on the subject of potassa fusa, M. Ricord agrees with modern surgeons that in small quantities the kali becomes saponified, and is insufficient; that in larger masses, when pressed against the obstruction, it is attended with the most serious consequences, and is not a remedy at all adapted to overcome the impassable stricture which every now and then comes before the surgeon.

I mentioned to M. Ricord the fatal results which had in London attended the operation of incising the perineum as recommended by Professor Syme. He thought that one or two unsuccessful cases should not deter us from prosecuting the plan, provided all others had failed.—*Lancet, July* 13, 1850, *p.* 51.

109.—CASES OF GONORRHŒA TREATED BY ACETATE OF POTASH.

By John Hilton, Esq., F. R. S., Guy's Hospital.

[Copaiba and cubebs so commonly used in the treatment of gonorrhœa, however the form of their administration may be varied, are of so disagreeable a nature, that praise is due to those who seek to produce their beneficial effects by remedial agents of a more pleasant and palatable kind. The following cases of the treatment of this disease by the acetate of potash alone will not therefore, it is hoped, be uninteresting.]

The first case refers to a man, aged thirty, a tailor by trade, who, when admitted, July 24th, into Samaritan ward, had been affected with a discharge for a week: the urine was very acid, and the scalding intense. The day after admission, Mr. Hilton prescribed half-drachm doses of acetate of potash to be taken three times a day. Five days afterwards, the scalding was relieved, the urine being still acid; on the thirteenth day, the scalding, though decreased in intensity, continued, and the urine remained acid; the acetate was therefore ordered to be taken every fourth hour. On the sixteenth day, the scalding was trifling, and the urine acid; on the eighteenth, the urine became alkaline; the scalding had disappeared, and the discharge had completely ceased for some days. The patients are always kept in the house a little time after its cessation, for fear of a relapse; and on the twenty-third day the patient was quite well, after having taken the acetate of potash three times a day for thirteen days, and every four hours for five days.

The second case is that of a bricklayer, aged twenty-five years; his affection may be looked upon as of a gleety character, for when he was admitted the discharge had been of nine weeks' duration. The half-drachm doses of acetate of potash were begun at the same time as in the preceding case; on the third day the scalding was better, and the urine acid; on the fifth the scalding was gone, and the urine neutral; on the sixth, the urine was alkaline; and on the eighth the discharge had completely ceased. This patient was therefore relieved of all his symptoms after having taken the acetate of potash three times daily for nine days, the result offering a striking contrast with the first case. As to the diet, Mr. Hilton considers that it ought to be unstimulating, and that the use of strong beverages is to be especially avoided.

The third case is that of a labourer, twenty-seven years of age; he had a gonorrhœal discharge for three weeks when he applied for admission. The treatment began in the same ward, (Samaritan,) on the 24th of July, as in both the preceding cases, and the acetate of potash, in an aqueous menstruum, was likewise ordered to be taken three times a day. The salt is also given with advantage in camphor mixture, and Mr. Hilton often supplies the patients with the acetate in powder, desiring them to dissolve it in water themselves. Here, however, no very material improvement took place for the first fifteen days, when the scalding became less, and the discharge began to diminish in quantity, the urine being acid. Mr. Hilton now ordered the same doses to be taken every fourth hour. On the nineteenth day the scalding continued, the discharge was less, and the urine slightly alkaline. On the twenty second, the urine became again acid, though the patient was taking the acetate every fourth hour. At this time diarrhœa set in, and the patient was precluded from continuing the acetate of potash. On the twenty-eighth day after admission, however, the use of the salt was resumed; it was taken every four hours for eleven days, when the scalding and discharge were entirely subdued. It should, however, be noticed, that even at this period the urine remained somewhat acid.

Mr. Hilton was led to give the acetate of potash a trial in cases of gonorrhœa from the following considerations. The urethra is in this disease in a highly inflammatory state. and the urine very acid; it is clear that the latter fluid in passing over an inflamed surface must tend to irritate it much, and retard the diminution of the inflammation. The acetate of potash, by its tendency to render the urine alkaline, will therefore remove one of the obstacles which lie in the way of the cure. This same salt has likewise most undoubted depurating properties, and its antiphlogistic powers are very remarkable. Its administration, then, will have the double advantage of rendering the urine less acid and irritating, and of reducing inflammatory action all through the system, and, as a consequence, in the urethral mucous membrane.

[Even where the disease does not yield by the use of the acetate of potash, Mr. Hilton has repeatedly found that, after its administration, a few doses of copaiba completed the cure and prevented relapse.]—*Lancet*, *Nov*. 2, 1850, *p*. 507.

110.—A PECULIAR FORM OF GONORRHŒA.

By W. Colles, Esq., Dublin.

[Mr. Colles remarks how frequently it is that if two cases of gonorrhœa are treated by the same routine of practice, one will be cured in the space of 2 or 3 weeks, while the other will continue for months and even years. Mr. Colles thinks there are various affections or morbid conditions of the neighbouring parts, which added to the inflammation of the urethra, contribute to keep up the discharge; but he confines himself to one, which he supposes renders the disease much more intractable in its nature and progress, and requires a modification in the treatment, and one which has hitherto attracted little attention. Mr. Colles has no doubt that the peculiar inflammation with secretion of pus from the lining membrane of the urethra, may commence at the orifice, spread along the entire canal, and very often extend to the lining membrane of the bladder itself, and even to the urethra and kidneys, while at the same time a slight cause directs it to the testicles, constituting hernia humoralis. He continues:]

The symptoms are I believe, never so severe as in that form of disease called catarrh of the bladder, when a thick ropy mucous is secreted in great quantity; they are at times so slight as scarcely to attract the patient's attention, who will merely consider that with him the symptoms are more severe than usual. I have seen this attack of the bladder ushered in with a severe rigor; and on close inquiry we may find that the patient labours under a slight degree of feverishness or uneasiness coming on or increasing towards evening; and that he will complain of a dull heavy pain across the pubis, extending round to the sacrum and anus, and at times even to the regions of the kidneys. The calls to pass water will be somewhat more frequent than usual, and when they do occur they are irresistible, attended with considerable pain and forcing, which continue for some time after the last drops have passed away, and which are referred chiefly to the neck of the bladder, and extend from thence to the perineum and anus. The urine, when passed, at times appears clear and natural; in general, however, we can observe a slight cloudiness through it, and on allowing it to settle in a glass vessel, we shall perceive, after one or two hours, a copious yellowish or cream-coloured deposit, consisting entirely of pus. If we take a drop of this urine immediately after it has been passed, before any alteration can occur in it, and place it under a microscope, it will be found to be loaded with pus globules. In some instances in this affection, a number of yellowish, shreddy particles will be seen floating through the urine, which at times alarm the patient, causing him to suppose he is labouring under seminal weakness; on examination these particles will be found composed of clusters of pus-globules and epithelial scales adhering together.

That the pus thus equally diffused through the urine has its source from the bladder, cannot, I think, admit of a doubt. It cannot be from the urethra alone, for I believe that there is a peculiar action of this canal on its contents, which tends to drive them forwards, and resists any retrograde movement. Besides the urethra alone could not pour out the quantity of pus we meet with in some of these cases.

My friend, Dr. Fleming, at my request examined the urine with the microscope in some of these cases, and the result of his observations is contained in the following extract from a letter I received from him on the subject:—

"As regards your views respecting those inveterate cases of gonorrhœa, which are so annoying to the patient and so puzzling to the surgeon, no second opinion can be entertained but that the lining membrane of the bladder furnishes a portion of the purulent fluid, and, as you remark, at a much earlier period than at first view would be suspected. To test the direct passage of the pus from the bladder, I have made the following experiments, both on the male and female. In the latter it is oftem most important to do so. I introduced a catheter, allowed the first ounce or so of fluid to escape, so as to get rid of the urethral discharge, then collected some of the urine in a clean glass, examined it forthwith with the microscope, and found pus globules. I have applied the same test in equivocal cases of hematuria, and found equally satisfactory results as regards blood globules."

In the case which first drew my attention to this subject, the patient a few days after infection had a severe rigor, with considerable pain and irritation of all the urinary organs, attended with a copious deposit of pus, exceeding eight or ten ounces in the twenty-four hours. He soon began to waste, became emaciated, and even symptoms denoting hectic set in; and it was only by great attention he ultimately recovered. I at first feared that an abscess must have burst into the bladder; but his previous good health, and the abscence of any symptoms indicative of a collection of matter, soon removed this impression. Since then, having suspected that this purulent state of the urine was at times both a consequence and a cause of the continuance of the disease, I have sought for its presence in several cases of gonorrhœa, and met with it much oftener than I had any reason to suspect; though I cannot form any conclusion as to the comparative frequency of its occurrence. I have observed the urine thus loaded with pus in two or three days after the commencement of the gonorrhœa, and afterwards keep pace with the original disease. I have also in two or three cases known the discharge from the urethra to continue, and pus to be found in variable quantities in the urine, for the space of nearly two years after the original infection.—*Dublin Quarterly Journal of Medical Science, Aug.*, 1850, *p.* 102.

[Mr. Colles offers no specific remedy for the removal of this affection,—we must treat it by the general principles of surgery. When the pus has once appeared in the urine, we must follow the antiphlogistic plan much more strictly than is commonly done; and when the inflammatory symptoms have subsided, we may then resort to those remedies considered as specifics—the balsams or cubebs.]

MIDWIFERY,

AND THE DISEASES OF WOMEN.

111.—SEPARATING THE PLACENTA FROM THE UTERUS IN CASES OF PLACENTAL PRESENTATION.

By the **Reviewer** of Dr. **Churchill's** 'Midwifery,' in the Edinburgh Monthly Journal.

[The largest new dissertations, says the reviewer, which Dr. Churchill has added in this edition, are, on the treatment of unavoidable hemorrhage by detachment of the placenta—on turning as a substitute for craniotomy—and on the use of anæsthetics in midwifery.]

If (says the reviewer) there is any truth in the doctrine of the maternal circulation of the blood in the placenta, as laid down by the Hunters (and all modern physiologists admit the soundness and truth of that doctrine,) blood *must* escape from the free uterine surface of the placenta when the placenta becomes partially detached from the uterine surface, as in cases of unavoidable hemorrhage; and, consequently, the flooding becomes arrested when the placenta is *entirely detached*—the plan of treatment which has of late years been proposed to be followed artificially, in instances in which the older modes of treatment were either ineffectual, or specially difficult and dangerous of application, as in dangerous unavoidable hemorrhage, with the os uteri still too rigid to allow of turning; when the mother is too exhausted to permit of turning; when the child is dead or non-viable, &c. Dr. Churchill considers that the hemorrhage in placental presentations does not come from the placenta, but that it escapes from the uterine sinuses, laid bare by the detachment of the placenta. In order to produce the hemorrhage in this way, nature must, at the time of its production, turn back and invert the course of the circulation in these sinuses. But this point we have not time to dwell upon.

Dr. Churchill reasons, and as we conceive, again inaccurately, on the probable number of placental presentations in which some other operation would be required *besides* the detachment of the placenta, provided this plan were adopted in the treatment. In numerous old cases detailed by authors, and in which the placenta was spontaneously expelled, and the hemorrhage ceased, the child, notwithstanding, was afterwards removed by operative interference, as by turning and craniotomy. A great number of these secondary operations were had recourse to merely because the attendant was terrified to risk the non-delivery of his patient, after the placenta was wholly separated.

But Dr. Churchill argues, that if we separate the placenta artificially, we will require to adopt these methods of forced delivery, just as frequently as was done formerly under fear of hemorrhage. Certainly not. In placenta prævia, mal-presentations of the child occur more frequently than in natural labours; but transverse mal-presentations, requiring delivery by turning, do not occur oftener than once in twenty cases. And we could point out to Dr. Churchill published cases of placental presentation, where turning, when it was required from mal-presentations, could not be effected till the placenta was removed. Dr. Churchill considers the detachment of the placenta improper in cases where the hemorrhage is very great, but the os uteri still not much dilated. These are certainly, however, the cases best adapted for the practice; and turning in them is frightfully fatal, from the tearing of the cervix uteri (the most vascular part of the whole uterine parietes in placenta-prævia), and the consequent liability to subsequent fatal hemorrhage or phlebitis. Dr. Churchill objects, that where the os uteri is still imperfectly developed, he does not see how the placenta can be easily or safely detached. And yet, in his chapter on the 'Induction of Premature Labour,' he does not see any difficulty in the practice of "separating the membranes for two or three inches around the os uteri," although, at the time of doing so, the os uteri is not in the very least degree opened. If the membranes can be thus separated before the os uteri is at all dilated, the placenta may certainly be equally, or indeed more easily, separated when the os uteri is already partly opened. And in relation to the practice, we are never to forget the true observation of William Hunter, that the placenta is as readily separated from the uterus as the orange is from its rind. After all, the value of the new treatment of unavoidable hemorrhage by complete separation of the placenta, will never be decided by mere theoretical reasoning and objections. Its value, like the value of other new practices, can be decided by the results of practice only. The time has probably not yet arrived when such a decision can be pronounced, because the practice is as yet too recent, and the cases in which it has been followed are yet too few, to permit us to judge definitely of its utility. But the cases and their results, as far as we know them, are in favour of the new practice. We have seen three cases in which the placenta was artificially separated, in accordance with the principles of the new practice: all the three mothers made good recoveries. Dr. Churchill alludes to seventeen cases collected by Dr. West; sixteen out of the seventeen mothers were saved. Dr. Waller, lecturer on midwifery at St. Thomas' Hospital, London, and a gentleman who has had extensive experience in this and other morbid complications, two years ago published a long series of interesting cases of placenta-prævia. In a late addition to his former communications in the "Medical Times,' he observes, "My confidence in Professor Simpson's plan in these cases, remains unshaken. It will be seen, in reference to my cases, that in nine instances the placenta was separated, either naturally or artificially, before the birth of the child. The same effect was produced in all, namely, *the cessation of the hemorrhage;* and eight of these women recovered. Surely this result could not have been accidental, as some would have us imagine. I am not (Dr. Waller adds) aware that any cases have been recorded wherein hemorrhage has *continued* after complete separation." In these 29 cases of the new practice we have two maternal deaths,—or 1 in 14 died. Out of 182 cases of the same complication, treated by the old plan, and given by Dr. Churchill at p. 388, there occurred 51 maternal deaths,—or nearly 1 in 3½ died.—*Monthly Journal of Med. Science, July,* 1850, *p.* 31.

[For our own part we beg to differ from Dr. Simpson, both as to the propriety of the operation of separating the attachment of the placenta from the cervix uteri in cases of placenta prævia, and as to the reason of the cessation of the hemorrhage. Our objection to this mode of practice is, that although it may be a safe one as regards the mother, it assuredly is a fatal one as regards the child. With regard to the second point, although of slight importance as far as the theory is concerned, it is, nevertheless, of the greatest importance as indicating a most valuable mode of practice to be adopted. We consider that the fact of the flooding ceasing by the method of manipulation introduced by Dr. Simpson, needs no very laboured explanation to account for it, for, we believe, that the separated placenta being still left in situ, acts merely as a mechanical plug upon the orifices of the bleeding vessels, promoting the coagulation of the blood in and around them, and thus effectually presenting a barrier to its further flow. How, then, is this indication to be fulfilled? We answer, simply on the same mechanical principle. If the os uteri is not sufficiently dilated to allow of the operation of turning being performed, our own practice has been for the last twenty years to introduce at once into the vagina sufficient soft linen, lint, or other suitable material as to form an accurate, well adjusted, and effectual plug. By thus filling the vagina no blood is allowed to escape through it, and hence it must accumulate immediately around the bleeding vessels; it cannot force its way into the uterine cavity, the entrance being there prevented by the placenta and the other contents of the uterus. Not only does the theory of this mode of treatment sound very plausible, but we have abundantly exemplified its real utility in practice. Indeed, we may even go a step further and explain the use of the plug, on, if we may be allowed to use the term, the hydraulic principle, and this explanation, as will be seen, applies equally well to hemorrhage occurring post-partum. The blood being prevented passing through the vagina, as we have already stated, cannot pass into the uterus, for its contents before delivery will not allow it; but we believe if the uterine cavity was completely emptied, the bleeding vessels being still situated at the cervix, no hemorrhage could take place above the level of their orifices, for as soon as the blood had reached this point, a coagulum would be formed which would cause a cessation of the flooding. It is manifest that the fact of the uterus being found in a relaxed state after labour, and, it may be, completely filled with coagula, is no argument against our theory, because, in these instances, the bleeding must have continued until the blood had reached the surface to which the placenta had been attached, although it may have been even at, or near the, fundus.

We have been in the habit of mentioning this explanation for many years in our lectures on midwifery delivered in the Leeds School of Medicine. Dr. Tyler Smith, indeed, in his article 'On the different Modes of Arresting Uterine Hemorrhage' in 'The Lancet,' Dec. 19th, 1848, and at p. 237, in Part XIX of the 'Retrospect,' makes mention of it, but it will be seen that in the pages 274, 275, in Part XV. of the 'Retrospect,' we had previously distinctly stated this view, in speaking of the treatment of placenta prævia. So far as we remember, Dr. Barnes is the only one besides, who has directed attention to it, and even he merely alludes to it in connexion with a partial presentation of the placenta. His remarks will be found at p. 275 of Part XV. of the 'Retrospect.'

The introduction of the plug in the early periods of placenta prævia has many great advantages which the plan of Dr. Simpson does not possess. It is perfectly safe and readily applicable; it promotes uterine action, ensuring the safe dilatation of the os; it preserves the strength of the mother by preventing the serious discharges which would otherwise take place; and lastly, it obviates the necessity, at least as little as possible, of endangering the life of the child. The plug so introduced may be removed every six or eight hours, or oftener, as the practitioner may deem advisable, to allow the evacuation of the contents of the bladder of the rectum, or any examination as to the state of the os to be made. If we find the os then sufficiently dilated, we immediately introduce the hand, separate only as much as is required of the placental attachment to the uterus, rupture the membranes, turn, and so expedite the labour as much as possible.

A long continued series of successful results enables us to speak positively on this subject, and we are quite satisfied, if the practice were always adopted, the cases having an unfavourable termination would be exceedingly few. Out of a very considerable number of cases which have come under our notice where this treatment was followed, certainly not more than two fatal cases have ever occurred.—Ed. 'Retrospect.']

112.—NEW METHOD OF ARRESTING UTERINE HEMORRHAGE.

By M. Diday, of Lyons.

[By a similar dilatable caoutchouc tube as that recommended by M. Gariel for epistaxis, M. Diday succeeded in arresting the uterine discharge when all other means had failed.]

The apparatus used consisted of a long tube with a little bladder at the extremity, which was introduced into the vagina, conducted by the index finger, and thus maintained in place whilst insufflation was practised at the other extremity of the tube. The bladder was thus increased in dimensions until it acquired a diameter of about twelve inches, the air being retained by means of a ligature on the free portion of the tube. The hemorrhage was instantaneously arrested; the patient regained strength; and after two days a small quantity of the air was allowed to escape, when no return of the hemorrhage occurring, the entire tube was withdrawn on the day following.—*Dub. Quarterly Journal of Med. Science, Aug.*, 1850, *p.* 129.

113.—USE OF TURPENTINE IN UTERINE HEMORRHAGE.

By John Griffith, Esq. Communicated by T. T. Griffith, Esq, Wrexham.

[Mr. Griffith makes the following epitome of observations on the use and value of large doses of rectified oil of turpentine, for hemorrhage; not with any claim to discovery, but as calling attention to the great rapidity, power, and certainty of its action in the most formidable cases of uterine hemorrhage the practitioner encounters.]

March 10th, 1847.—Having assiduously, but unavailingly, employed the best remedies known to me in a protracted menorrhagia, half an ounce of oil of turpentine was given, as suggested in 'Blundell's Principles and Practice of Midwifery,' which quickly abated the discharge, restored the pulse, and revived the exhausted patient. In four hours the dose was repeated, with a result the most satisfactory.

Dec. 24th, 1847.—Mrs. J. flooded to an alarming extent after delivery; pulse almost imperceptible; great restlessness; skin cold and clammy; occasional sighing; countenance cadaverous. One ounce of turpentine was given, pressure was made on the uterus, its cavity cleared of coagula, cold wet napkins were applied externally, and yolk of egg with milk was recommended. In a very short time the discharge greatly abated, and the other symptoms disappeared sooner than could have been anticipated. In an hour the woman was able to articulate, and stated that shortly after taking the draught she "felt a sense of warmth all over, and had a hope of recovering, instead of the feeling that she was dying."

April 16th, 1848.—Mrs. S. was brought into a fearfully dangerous state, from partial separation of the placenta, prior to delivery; turning was promptly effected, but followed by terrific loss and prostration; the woman resembled a corpse; it seemed as if a few minutes would terminate her existence. An ounce of turpentine was taken, and repeated in five minutes, followed by the most signally happy result, as rapid as gratifying.

Since March, 1847, eleven instances of excessive and dangerous flooding, prior or subsequent to parturition, and six of menorrhagia, have come under my notice, where the great value of this remedy has been exemplified. Turpentine is not recommended where there is a full pulse, hot skin, with undiminished strength; and when resorted to, other appropriate means should not be disregarded; as abdominal pressure, removing coagula from the uterus, the external application of cold, and not allowing the patient to be moved, &c.

The most convenient way of giving the remedy is giving an ounce of turpentine with half the quantity of oil of sweet almonds, for a draught. This may be repeated in five minutes if the symptoms are urgent. No unpleasant effect has arisen from such a course of treatment, even when the medicine has remained with the patient for thirty hours. Occasionally vomiting occurs, which is salutary.

The *modus operandi* is that of a diffusible stimulus, bringing on rapid contraction of the capillaries, adapting the calibres of vessels to the diminished column of blood, restoring the cutaneous circulation, and producing a comfortable sensation in the place of extreme coldness and death-like exhaustion.

In the cases of menorrhagia, various remedies had been in succession energetically and perseveringly employed without success, such as nitrate of potass, superacetate of lead, sulphate of zinc, infusion of matico, gallic acid, tannin, very large quantities of cold astringent injections; and in the floodings, secale cornutum, galvanism, strong abdominal pressure, plugging the vagina, external cold, &c.

In some of the cases I had the able assistance of Dr. Lingen, who joins in stating that we know no remedy that could be safely substituted for full doses of turpentine in those dangerous cases that so often threaten, and too frequently have proved fatal, notwithstanding the best devised and the most prompt and energetic use of means.

Dr. Lingen's Cases.—Mrs. P., labour a little premature, preceded by hemorrhage; but not from placenta prævia. I was not called to her till she was blanched by loss of blood, and was nearly pulseless. I was obliged to turn with all expedition. This was soon followed by the most alarming exhaustion I ever witnessed, attended with restlessness and relaxed state of the uterus. A turpentine draught was given, with almost instantaneous effects, namely a glow of warmth, a return of vitality, and a lessening of the discharge, &c. After a few minutes a second draught was given. All hemorrhage now ceased, and she slowly rallied. This case, with a few other particulars, forms the second in Mr. John Griffith's series.

Miss ——, suffered from menorrhagia of a passive and painless kind, that had for the fourth time reeurred during the last two years, with a continuance each time of five or six weeks. She was pale, breathless on exertion, had noises in her ears, &c., and was at length compelled to recumbency. All the ordinary remedies, general and local, had been employed, without success. I now gave her a draught, with one ounce of turpentine; this may be said to have ended the matter, though two small doses were afterwards taken, and more than a month has passed without any return of the discharge.—*Prov. Med. Journal, July* 24, 1850, *p.* 400.

114.—PERMANENT RETENTION OF THE PLACENTA FROM MORBID ADHESIONS, WITH REMARKS.

By Dr. Robert T. Corbett.

Mrs. S., æt. 30, seven months in her sixth pregnancy, and of a debilitated habit, became my patient on the 16th May, 1850, when she complained of uneasiness in the belly, of four days' duration, attributed by her to a fright. She said that the membranes had ruptured, and that a large discharge of water had taken place. On examination, the os uteri admitted only the point of the finger. I could not tell whether the waters had escaped or not. Bowels regular, from the use of medicine. An opiate was ordered.

17th.—Much the same as yesterday; os uteri as on former examination. Bowels not moved to-day. Opiate to be repeated.

18th.—Os uteri dilated to the size of a half-crown piece, and pains decidedly uterine, considerable bloody discharges. As she was a weakly woman—the child undoubtedly small, and supposed to be dead, from motion having discontinued to be felt by the mother, and from the sound of the fœtal heart and placental soufflet having ceased to be heard, to terminate the labour, I gave four half-drachm doses of the ergot of rye in infusion, every twenty minutes, without effect. Habeat enema domesticum quam primum.

19th.—Bowels opened from enema; had slept very well; os uteri a little more dilated; still considerable oozing. Pains those of labour, and stronger than yesterday. I administered the ergot in the same doses as the day before, but the drug was of a fresher quality. The pains were very much increased in power and frequency by its exhibition; some were even considerably protrusive, but nature had not the power, and the effects of the drug wore off. I then administered an opiate, to quiet the system and procure sleep.

20th.—Patient had had a few hours refreshing sleep during the night, and this morning at half-past nine o'clock, the fœtus was expelled, with little suffering, and slight labour pains. I was sent for. On my arrival I found the fœtus expelled, and in a putrid state. The placenta was still in the uterus, which was flaccid. The cord came away with the very slightest traction. After dashing whiskey over the abdomen, grasping the uterus tightly, and trying the usual means to make it contract, and persevering for half an hour, as there appeared to be very little if any contraction, the left hand was completely introduced into its cavity, when the membranes were found to adhere all around, so that I could not positively say that I felt the border of the placenta, although I thought so, from my fingers passing over a rounded ridge. The usual plan of separating it, by insinuating the fingers between it and the uterine surface, and gently moving the hand from side to side, with a sawing motion, being out of the question, the plan of Hamilton and Burns was tried, without effect. The uterus contracted powerfully upon the hand, but became quite flaccid as soon as it was withdrawn. My manipulations were continued for about forty minutes A bandage, with a compress, was now tightly applied, a grain of opium given, and the patient left to rest. The patient progressed as well as is usual in an ordinary convalescence after delivery, till the evening of the 25th, when, after the loss of not more than 12 or 14 oz. of blood by hemorrhage from the uterus, she died, notwithstanding the free exhibition of stimuli; in short she never rallied from the collapsed state, which immediately followed the discharge, and died in four hours. As I became aware of the intimate adhesion between the placenta and the uterus at my first attempt at extraction, and as in such cases I do not approve of any after attempts at removal, no further trial to separate it was made.

Inspection 60 hours after death.—Three medical gentlemen besides myself were present. Upon opening the cavity of the abdomen, the uterus was seen 6½ inches long by 4½ broad, having a baggy empty feel, but presenting a healthy surface. The uterus was detached from its position, and an incision made longitudinally through its anterior wall, when the placental mass and membranes were seen to fill its cavity. The inner surface of the uterus presented a dirty green or blackish hue, and after having been repeatedly and carefully washed, was found to be wholly covered by a lining presenting a granular fleshy appearance, at least ⅛ of an inch in thickness, in some places even more. This membrane, was, with some difficulty, separated, to a trifling extent, from what appeared to be the disorganised lining of the uterus. The placenta adhered to the superior and anterior part of the uterus, rather to the left side, which was the spot where I had felt it. The adhesion was complete, and so perfect that the placenta could not be detached without destroying its own substance, or that of the uterus. We could not discover the spot from which hemorrhage had taken place. The structure of the placenta resembled that of a hepatized lung, but was more fibrous, and was so intimately connected with the parietes of the uterus, as to render it impossible to tell where the placenta terminated, and the uterus commenced. The fœtal membranes were also very extensively and intimately attached to the walls of the uterus; indeed so intimately, that the attachments could be broken only with great force, and would of themselves have been a cause of retention of the placental mass.

[In conclusion, Dr. Corbett remarks,—]

1st. That this case proves the truth of the generally received opinion, that all efforts to extract the placenta may be unavailing.

2d. That it strengthens the opinion "that constitutional predisposition is a more frequent cause of morbid adhesion than any other."

3d. That it proves that morbid adhesion of the placenta is produced by the formation of a new membrane, the result of increased action in the lining membrane of the uterus, and by the peculiar character of the blood in pregnancy.

4th. That it proves that agglutination of the fœtal membranes to the uterus, of itself may be a cause, if not of permanent retention of the placenta, at least of retention of it, until putrefaction shall so have destroyed their texture, as to permit of the mass falling away; although, from the nature of the disease, such a case must very seldom occur.—*Monthly Journal of Med. Science, Nov.*, 1850, *p.* 410.

115.—MENSTRUATION IN RELATION TO PREGNANCY.

By Prof. Dubois.

Conception (says the professor) may take place in a woman not yet arrived at the age at which she ought to menstruate. There are, in fact, many women who do not menstruate till the seventeenth, eighteenth, or nineteenth year. Such women may become pregnant at that time of life, although they have never menstruated. M. Dubois has seen a woman become pregnant two years after the cessation of the menses. The woman finding her abdomen enlarging, entered the medical department of an hospital. The physician under whose charge she was, had so little idea of the woman's being pregnant, that he delivered a clinical lecture on the case, as one of ovarian dropsy. On making an examination of the case, M. Dubois easily made out the pulsation of the fœtal heart. In fact, labour very soon supervened.

The menses may be suppressed physiologically, and yet pregnancy take place. Thus, it is not rare to see nurses become pregnant before menstruation has re-appeared. We find also, that women who are extremely irregular, who, for example, menstruate only once or twice a year, become pregnant; although, in general, this state is one very unfavourable for conception.

Various diseases and changes in habits may derange the menstruation, and give rise to the idea of pregnancy. This error occurs frequently, chiefly to persons anxious to become in the family way. Nothing is more common than to find the menses suppressed for some time after marriage. It is also very frequently observed, that women leaving the country to reside in the town suffer from suppression. This may be said to occur habitually in young women coming from the country into domestic service in Paris.

In other cases, the menses, after having been suppressed for three or four months, re-appear suddenly, with some profuseness. This is sometimes taken for the occurrence of abortion, when it is merely the recurrence of the menses after they have been suppressed, in consequence of some change in the habits of the female.—*Journal de Med.*—*Monthly Journal of Med. Science, July*, 1850, *p.* 73.

116.—PROLAPSUS OF THE PREGNANT UTERUS.

By Dr. Merriman.

[The following is extracted from a letter to the Editor of the "Medical Times":—]

In Professor Rizzoli's case, the procidentia had, as usual, been temporarily cured by the enlargement of the uterus, causing it to rise into the abdomen; but of course when labour pains came on, the uterus was again drawn down, even to the extent of being propelled beyond the vulva—an occurrence which several cases on record have demonstrated to happen occasionally. It seems fair to suppose that the first pain produced this occurrence, combined as it was with the "raising a great burthen;" but we are not clearly informed whether any part of the uterus itself was propelled beyond the vulva, except by inference from the tearing of the perineum, and "a body" being felt to pass. How the perineum can have been torn at this time, unless the uterus with its contents had passed the os externum, I do not understand; yet it seems to have been found ruptured by the accoucheur on his arrival, before he had recourse to instruments. We are told that "a small foramen allowed a finger to pass up to the head itself." Of course the part most protruded would be the vagina; but we are not told that the os uteri was felt at all; are we then to understand that the os was fully dilated? That seems improbable; but if the practitioner had taken care to observe the facts, he would not have been so much at a loss, as he appears to have been, what treatment he should pursue. Again, we are told that attempts at reduction were vain, from the recurrence of pains; and that after some time mortification appeared imminent, from the amount of congestion observed in the protruded vagina. But to what is this congestion to be attributed? Was it not from the pressure of the distended uterus upon the veins of the displaced vagina preventing the return of blood from it? If so, a constant firm support from the hand of the attending practitioner from the first would surely have prevented it; besides that, more than this, it would have enabled the contractions of the uterus to propel the head of the child against the os, and thus to dilate it. This, however, could not happen if no counter-pressure was exercised against the bearing down of the pains.

Medical practitioners of the present day seem too little disposed to look back and learn what others have done in times past; yet there are on record several cases of *procidentia vaginæ et uteri*, at the commencement of labour, which well deserve to be consulted and borne in mind. Let me refer to a few of these. In a case recorded by Mr. James Shaw, in the 'Memoirs of the Medical Society of London,' (Vol. I., p. 213, A. D. 1786,) when mortification appeared commencing, the perineum was found, on examination to be dilatable; it was, therefore, dilated by the finger; the protruded mass then slipped back; and the patient fell asleep for two hours; after which, pains again came on, and a fine boy (her fifth child) was born by the natural efforts. The woman bore subsequently two children, and never afterwards complained of more than a slight bearing down.

In the 'Medical Museum,' (Vol. I., A.D. 1763,) Mr. Antrobus, of Liverpool, describes the case of a poor woman, who conceived of her fourth child while labouring under a prolapsus uteri." She went her full time, although the cervix became "scirrhous" from exposure, and, at the time of labour, the first pain drew up the uterus, but the waters afterwards breaking, it was propelled down again before the head. Counter-pressure was therefore made, and the part lubricated; the child was born, and the "prolapsion" replaced. The woman did perfectly well.

Mauriceau gives the following case (Obs. 6, A.D. 1669):—The uterus had protruded during labour to the extent of half a foot, and was as big again as the head of an infant. The os looked like a phymosis, of which the lips were three fingers' breadth thick, and quite livid. He introduced his hand by degrees into the uterus, and thus guided the head in its exit. He subsequently applied a pessary.

Portal (Obs. 10, A.D. 1666) describes a case of protruded uterus in a first pregnancy, where the orifice was only half a line across. After consulting with M. Moreau, he introduced very carefully a silver sound; by this means he was enabled to insert his finger, and so dilate the orifice still more, it being, after three hours' dilatation, the size of an "*ecu blanc.*" After an hours' cessation, the dilatation was renewed, by both hands being carefully insinuated; the bag of waters assisted, and two pains brought the child into the world. The uterus was replaced, and all did well. The woman, previously to her marriage, had always had a "relaxation," but could easily replace the womb. During her pregnancy, however, it ceased to come down till the labour set in. In several respects this resembles the case recorded in the 'Medical Times.'

Smellie (Collection XVII., No. I., Case 2, A.D. 1746) describes a third labour, in which the os uteri was pushed down by the pains beyond the os externum:—"During every pain I kept up the child's head, and the mouth of the womb, which I gradually dilated with my finger, till, being fully opened, it easily slipt all round the head, and this afterwards opening the os externum by degrees, was safely delivered." Perfect (Case 77, A.D. 1766) relates a case in which there was "an entire hernia of the uterus," yet the os uteri was "so high up, that he could but just reach it with his finger in the vagina." "He gradually distended the os tincæ," introduced his hand, and, finding the feet presenting, seized them and brought away the child.

The case related below has never, I believe, been given to the public. I have, therefore, the more pleasure in introducing it here, as it is an excellent example of this class of labours. The case occurred several years ago in the practice of Mr. Gristock, surgeon, of Wardour Street, Soho. Mrs. Purdie, the wife of a journeyman gunmaker, in Little Pulteney Street, a delicate woman, had already been the mother of two children. After the birth of the second, she was much troubled with a sensation of bearing down, and sometimes of a slight protrusion of the uterus, which she endeavoured, very ineffectually, to remedy, by wearing some kind of bandage. The protrusion became greater when she next became pregnant, but diminished, and was at length wholly removed, as the uterus enlarged from gestation. When, however, the labour drew near, she was again sensible of much weakness and bearing down; and at length when the pains actually came on, she was much alarmed by finding that a large fleshy mass had passed through the os externum with a good deal of fluid discharge. She sent for Mr. Gristock, who found that not only a considerable portion of the vagina was protruded, but that the os uteri was to be felt considerably without the os externum. He ordered her to bed, had the parts freely fomented, and requested a friend to visit the patient with him. They found her much alarmed, but presenting no symptoms indicative of danger. It was, therefore, determined not at present to employ any active interference. The pains at first were not strong, but as they increased in strength, it was thought advisable to expand the hand over the protruded part, so as to make the ends of the fingers afford five points of support to the prolapsed vagina. By degrees it appeared to recede during the pains, and, at last, during a very strong pain, the whole mass slipped up into the pelvic cavity; the infant was speedily born, the placenta came away, and the uterus contracted firmly, remaining in its proper situation. This woman got quite well, and in less than two years became pregnant again; she then came under the care of Dr. Hugh Ley. The same procedentia again took place, and was managed in the same way, with the same happy result. After some time she became pregnant again, but on this occasion there was no prolapsus; the child was found to present by the arm, and was turned by Dr. Ley, but was stillborn. A very interesting question may be asked here, namely, Did the transverse position of the child on this occasion prevent the ready subsidence of the uterus into the pelvis? I have been unable to obtain any further account of this person after this last confinement.

I cannot help regretting that the accoucheur in the case recorded by Professor Rizzoli did not practice the same form of treatment which has proved so effectual in the hands of the above-named experienced practitioners. He would then, possibly, have saved the life of the child, and have avoided the lacerations of the vagina and consequent hemorrhage recorded. Let me merely add, that I have presumed, in this criticism, that the rupture of the perineum took place before the medical man arrived; but if we suppose that, as in Mr. Shaw's case, the uterus descended without tearing the perineum, the employment of the forceps would be almost certain to produce that accident.—*Med. Times, April* 7, 1850.—*Monthly Journal of Med. Science. November,* 1850, *p.* 474.

117.—SUCCESSFUL CASE OF EXTRACTION OF THE CHILD BY THE CÆSAREAN SECTION, AFTER THE DEATH OF THE MOTHER.

By George Harley, Esq., House Surgeon to the Edinburgh Maternity Hospital.

(Read by Dr. Simpson, on 5th June, at the Meeting of the Edinburgh Medico-Chirurgical Society.

[The mother in the case, Catherine Davidson, aged 39, unmarried, was admited into the hospital, being in the seventh month of her second pregnancy. She stated she had been very delicate during her pregnancy; complained of shortness of breathing in ascending stairs, and of dyspepsia. As her legs were swollen, and her face pale and puffed, her urine was tested, but no albumen was found present. On the 25th of April, 1850, nearly a month before her expected confinement, Mr. Harley was summoned to her assistance, the matron stating her to be in a state of suffocation. Mr. Harley, on reaching her, found her with all the symptoms of approaching asphyxia, and the countenance denoting intense anxiety. He immediately ordered her dress to be loosened, and her stays torn off; as soon as she could be placed in her bed, an emetic of ʒss. of sulphate of zinc was administered, but the symptoms becoming gradually more urgent, laryngotomy was performed. There being no tracheotomy tube in the house, Mr. Harley cut about 3½ inches off a full-sized flexible male catheter, and introduced it; but as the mucus did not readily come through it, it was withdrawn. The emetic was now repeated, and in less than five minutes above eight ounces of white frothy matter was expectorated. As the symptoms still increased, Mr. Harley proceeded to perform the operation of tracheotomy; but before the operation was much more than half finished, all attempts at respiration ceased. Mr. Harley continues :]

All hope of saving the woman being lost, my next thought was to save the life of the child; so I again snatched up the bistoury, ripped down the patient's dress, and instantly made an incision in the mesial line, through the parietes of the abdomen, commencing a little above the symphysis pubes, keeping close to the right side of the umbilicus, and terminating a little above it. The uterus then appeared, and I proceeded to make careful incisions in it, to avoid wounding the child. In making these incisions none of the intestimes came in the way of the knife, and there was very little or no bleeding from the wounds.

When the cavity of the uterus was reached, the liquor amnii escaped. I put the two first fingers of my left hand into it, laid the back of the knife against them, and cut downwards and outwards. One side of the nates now appeared. I then put the right hand into the uterus, caught hold of the first thing that came in my way, which happened to be a leg, and withdrew the child without any difficulty, the uterus not contracting round the neck.

The child, on extraction, looked beautiful and clean, as if it had been carefully washed; it was to all appearance quite dead, no pulsation being felt, either at heart or cord. I dashed cold water on its chest, gave it a rub, and then put my mouth to its mouth, depressed and pushed back the larynx, held the nostrils with one hand, and pressed on the chest with the other, after each time that I filled the child's lungs with air.

After a few minutes I stopped to take breath, and during that time I applied friction and aqua ammoniæ to the breast, and on using artificial respiration for some minutes more, the child's heart began to beat, and the pulsations in the cord became distinctly visible; a ligature having been put upon it, the child was cut away. It was a male, weighing 6℔. 12 oz., and measuring 18¼ inches. Shortly afterwards I put my hand into the uterus, and peeled the placenta from the back part and right side of the organ, as it would not come away by pulling at the cord; it weighed 1℔. 4 oz., and the cord measured 20 inches. The wound was stitched up, and the body removed into the delivery room, where the post-mortem examination took place.

Not more than twenty minutes elapsed from the time the patient was seized in the kitchen till all was over.—*Monthly Journal of Medical Science, July,* 1850, *p.* 21.

118.—TURNING SUCCESSFUL IN A CASE OF FIBROUS UTERINE TUMOUR, OCCUPYING THE CENTRE CAVITY OF THE PELVIS, AND SUBSEQUENT EXPULSION OF THE TUMOUR.

By D. R. Rankin, Esq., Carluke.

The attention of the profession having been lately directed by Dr. Simpson (See Retrospect, part xvii., p. 278) to the question of turning in certain cases of small pelvis, to avert the destruction of the child by craniotomy, the following question is asked, "Does experience teach that the base of the head offers less resistance than the vertex in passing through the outlet of the pelvis?" The case of Mr. Rankin will illustrate the point.]

Mrs. G. is 27 years of age, and the mother of five children. The first two births were natural; but in the third (24th August, 1846) some difficulty, I learn, arose in the early stage, to the probable cause of which her subsequent history points.

At the fourth birth (31st March 1848,) the difficulty became too apparent. After watching the efforts of nature for thirty-six hours, and finding that though the head had entered the brim of the pelvis, an insuperable obstacle hindred its further progress, Dr. Selkirk, whose case it was requested my advice and assistance.

A large tumour was found to occupy the right hypogastric region, producing displacement of the uterus; and on examination, the vagina was found to be depressed, as well as compressed, and thrown upon the left side of the pelvis by the tumour, which thus occupied the greater part of that cavity. By the ordinary mode of examination, the uterus could not be reached; but on introducing the hand, the head was found free of the uterus, although completely retarded from farther progress by the counteraction of the impending mass.

As there seemed no alternative, perforation was resolved upon, which, from the little mobility and incompressibility of the tumour, was not easily accomplished; but the ultimate extraction of the child was effected, after tedious, difficult, and careful manipulation with the crotchet.

When a subsequent pregnancy came to the knowledge of the medical attendant of the family, he naturally felt anxious. Encouraged in the attempt, the induction of premature labour was tried by him in the seventh month; but it could not be accomplished, the uterus being displaced, and beyond reach.

On the 1st February, and again after an interval of some days, I examined Mrs. G., with the aim of determining how her case was to be met when the urgent hour arrived. The prospect was most unpromising. The recollection of former difficulties, with the certain knowledge that the obstructing agent was more formidable than before, made me look forward to the crisis with a feeling of awe. To lessen the burden of responsibility, and in order that the patient might have the advantage of the best advice, Dr. Wilson (of Glasgow) was consulted on the 9th, and through him was secured the advice of Drs. Watson and Macfarlane.

All concurred in viewing the case as one of great difficulty, involving the probability that the Cæsarean operation might, of necessity, be resorted to, should turning fail. Efforts were made to secure the consent of the patient to remain in Glasgow, under Dr. Wilson's care; but she declined, and reluctantly I had to undertake the case.

On the 25th of February, labour pains came on. Dr. Selkirk had been in attendance about twelve hours, during which time the pains were not urgent. In a note I had from him that night, at nine o'clock, after intimating the onset of true pains, he stated,—"the tumour feels as hard and unyielding as ever. The passage of the child will prove an impossibility." On examination, two hours afterwards, the tumour was found to occupy the entire cavity of the pelvis, and was acted upon and pressed down by every effort of the womb.—The presenting parts could not be reached by the ordinary mode; but on introducing the hand, to ascertain how far the tumour could be displaced upward, it was found obedient to pressure to some extent; and by passing the hand onward, on the left side of the pelvic cavity, against which the vagina was forced, a small bag of the protruding membranes was felt; but, unwilling to rupture them at this stage, and as it was otherwise impossible to reach the womb, I resolved, in absence of any urgent symptom, to wait till the distended membranes exercised somewhat longer their relaxing influence. At half-past one o'clock on the following morning I introduced my hand, moulded the passage by acting on the tumour through the walls of the vagina, and passed the hand up carefully till I became sensible of the presenting parts, through the well-dilated orifice, which was situated above the edge of the left ilium. The liquor amnii was now evacuated; the hand passed into the womb, and what proved to be the left foot was secured. Very considerable force was necessary to bring the child into the pelvis. During the operation, the tumour was gradually forced up from the cavity of the pelvis into the cavity of the abdomen, and a sensation of tearing was communicated to the hand, and rendered audible, which led me to conclude that some fearful disaster was impending. This was soon found to be referable to the parts of the mother; for the child was delivered uninjured, though in a state of asphyxia, from which it rallied within ten minutes.

The placenta was thrown off within fifteen minutes, the uterus contracting regularly and satisfactorily above and partially behind the tumour.

A train of symptoms, by no means promising, followed. There was acute pain in the uterine region for several days, much sleeplessness, and occasional delirium. A fetid discharge followed, and a smart attack of erysipelas of the face and head came on. On examination on the seventh day after delivery, the maternal canals over the most prominent part of the tumour were found to be in a sloughy condition. A few days after, a small projecting mass was found in the seat of the slough, and fetid parts constantly escaped, the nature of which was not ascertained. On 3d April—the thirty-eighth day after delivery—the patient informed me that something protruded from the vagina; and with little difficulty, the parts being all but free, I extracted a partially putrid mass, of flattish form, ten inches long, five broad, and weighing fourteen ounces,—consisting of a dense fibrous substance, fringed here and there with small cells, emptied of their contents.—*Monthly Journal of Med. Science, July 1850, p.* 13.

[We think this practice of turning, in cases of deformed pelvis, as illustrated by the preceding case of Mr. Rankin, strongly corroborated by some remarks made by the reviewer of Dr. Churchill's Midwifery in the 'Edinburgh Monthly Journal' for July, 1850, p. 34. Dr. Churchill is said to quite misunderstand Dr. Simpson's principles of practice, when he fears, that in some cases, we might turn the child and yet find the pelvis too small to let it pass without craniotomy. The reviewer says:

Among Dr. Collins' 16,000 cases in the Dubiin Hospital, there was no pelvis too small, for there was none below 2½ inches in its conjugate diameter, and only one so small even as this; and we have seen a full-sized child pass through as small a pelvis by turning, its head becoming compressed during its passage. Dr. Churchill objects that, for the success of turning in contracted pelvis, we must be able to ascertain the "exact diameters" of the pelvis. He might as reasonably argue that, for the success of craniotomy in contracted pelvis, we must be able to "ascertain the "exact diameters" of the pelvis.—The general case is this,—the head becomes arrested at or above the brim, in consequence of the head being slightly too large, or the brim too small; and the question is, how is delivery to be effected? Take a steel perforater (says Dr. Churchill,) introduce it through the cranium of the child, allow some of the brain to escape, so as to diminish the head, and thus allow of its passage. We say, no; if the child is alive, and there is no contra-indication, extract the infant by turning, and in its extraction subject the flexible skull of the child to transient, and not necessarily fatal compression, rather than to fatal perforation. He fears that, even if the child were turned, we might sometimes still require to reduce its head by perforation after all. But if so the operation is more simple than if the arch of the cranium presented, in so far that no crotchet is then required.

He objects further that the operation would be of "very little benefit to the child." Certainly we admit that *all* the benefit it receives is giving it life, or a good chance of life, instead of being submitted to certain death, by having its head perforated. Numerous children's lives have been already saved by the practice. And we feel fully assured of one fact, that in proper cases the operation of turning gives the mother a far better chance of escape; turning, according to Dr. Churchill himself, in other parts of his work, being an operation fatal in about one in every sixteen cases to the mother, whilst, by his own showing, craniotomy is fatal in about one in every five cases to the mother, and, of course, in every case fatal to the child.—*Monthly Journal of Med. Science, July*, 1850, *p.* 34.

119. REMARKS ON THE STRUCTURE OF THE NECK OF THE WOMB, AND ON ONE OF THE NUMEROUS FORMS OF DISEASE TO WHICH IT IS LIABLE.

By Dr. Edward J. Tilt.

[Dr. Tilt describes this form of disease, which he has met with, and which he supposes arises from a form of inflammation of the neck of the womb, as an erectile swelling on that part. Making a few observations on the anatomy of the neck of the womb, which he states is still imperfect, Dr. Tilt says, with regard to the muscular fibres, that their disposition and proportion have not yet been thoroughly investigated, but that it is admitted by Theller, Burns, Negrier, and many others, that they exist in smallest proportion in the surgical neck of the womb. He then proceeds:]

As the erectile structure of the os uteri was not acknowledged by Dr. Snow Beck, I requested Mr. Quekett to give me the benefit of his great experience in microscopical investigations, and we examined the disposition of the minute vessels in three specimens for which I am indebted to my friend Dr. Jenner. One of the specimens was removed from a middle-aged woman, who had borne children, another from a girl of sixteen years of age. On examining perpendicular sections of the lips of the os uteri of both subjects, Mr. Quekett showed me distinctly the looping of the blood-vessels, their varicose distention in certain points, and more particularly at the branching off of blood-vessels one from another—a disposition of blood-vessels which is characteristic of erectile tissue, as it exists in the lips or the nipple. The third specimen was taken from an old woman; the os uteri was so completely effaced, that although there was a very small aperture communicating with the womb, this aperture was not surrounded by any lips. On examining, however, sections of tissue removed from the vicinity of this aperture, we could not distinguish any varicose disposition of the minute vessels. Neither could we do so in a fourth specimen, exactly similar to the preceding one, which was sent to me by Dr. Allen, and which I lately examined microscopically with Dr. Hassall.

These researches tend to prove that during the reproductive portion of the lifetime of woman the lips of the womb are permeated by minute blood-vessels, which are similar in disposition and structure to those of the nipple and other erectile tissues; but further investigations and careful injections are necessary to give certainty to what I now offer as probable.

On passing the uterine sound, I have sometimes seen the lips of the os uteri enlarge and become more turgid; but knowing how easy it is to see what we suppose we ought to see, I should not have mentioned the fact if Dr. Taylor Smith had not assured me that he had seen the same.

Supposing the erectile disposition of vessels in the neck of the womb to be fully confirmed, the morbid development of that disposition would well account for a form of uterine disease, which has been described by Dr. Ashwell, and which Duparque has confounded with others under the name of "engorgements congestifs du col," and which Professor Recamier has long ago called "erectile swellings of the womb," having been led to adopt that denomination, not on account of any anatomical researches, but by the peculiar characteristics of such tumours. Whatever may be the explanation of that pathological state of the os uteri to which I at present direct attention, I contend for the fact of its not unfrequent existence; and the following case is an example of the rest:—

Case.—A few months since I was consulted by a lady, aged twenty-five, who had menstruated for the first time at the age of fourteen years, and who did so regularly till she married, three years ago. Since then she had suffered from dysmenorrhœa, and latterly from backache and leucorrhœa. After adopting the usually employed method of treatment by injections and tonics for three weeks, I made an examination, and found the vagina hotter and more irritable than usual; and on applying the speculum, its field was filled by a well-circumscribed substance of a bright red colour, and yielding to pressure. On enlarging the aperture of the speculum (Coxeter's), it was easy to see that the whole mass was formed by a swollen lip of the os uteri, which on being carefully dilated, did not present any erosion or ulceration, either on its external portion or in its cavity. The internal mucous membrane was redder than usual, and there was an increased flow of the normal glutinous secretion. I scarified the swollen surface, and ordered tepid injections, mild purgatives, and repose. A few days after the tumour was smaller, more livid, less painful, less tense on pressure, and I whitened it by rapidly passing the nitrate of silver over its surface. I ordered injections with a cold solution of alum. I repeated the application of the nitrate of silver every five days for a month: and finding that the swelling did but slowly decrease, I applied iodide of iron to it every four or five days with a large camel-hair pencil, and in three weeks the swelling disappeared. The patient was under treatment for three months; and never during repeated speculum examinations could I find any other lesion of the neck of the womb, except an increased intensity of colour.

Sometimes both lips are swollen, but generally only one is so. Out of twenty well-marked cases of this description which I have observed, in two the swelling was general; in eight, the posterior lip was swollen; and in ten the interior. When one lip is swollen the shape which it assumes puts one more in mind of the rump of a fowl than of anything else. Most of my twenty patients were of a lymphatico-sanguine temperament; they were all married, and in five the complaint came on within the six months which followed marriage. In almost all the cases intercourse was painful. Sixteen of the cases were dispensary patients; the other four were ladies refractory to the exigencies of judicious treatment.

These details led me to infer that this particular form of uterine disease is principally caused by matrimonial intercourse, and by the necessity in which the poor are placed, of standing about for hours after they have been more or less severely cauterized. This influence of long standing after cauterization, is borne out, so far as my experience goes, by the fact of the same thing occurring in women moving in a higher sphere, and who, very soon after cauterization, are found dancing till two or three o'clock in the morning.

That this form of disease may be attended by, and caused by, erosion of deeply-seated ulcerations of the cervix, I fully believe; but that it does not always depend upon ulceration is proved by the fact, that in twelve out of my twenty cases I could not detect any solution of continuity of the uterine mucous membrane.

I have already pointed out the treatment I employ in such cases. When the tumour is hot and tense, and red, leeching and scarifications must be had recourse to. I prefer to scarify the tumour, or else to apply two or three leeches to the vagina in its vicinity, in order to disgorge the tumour without irritating it by the leech-bites. These cases are obstinate on account of the recurrence of the causes alluded to; and it is better to ring the changes on the different styptics we possess, than to persevere in the use of one. I never employ potassa fusa in this form of uterine disease; I principally make use of nitrate of silver, and I have, with advantage, alternated its use with that of the solid sulphate of copper, or a strong solution of diacetate of lead, or of the iodide of iron.

I deny the propriety of leaving such cases to themselves; sometimes, no doubt, they would be dispersed by the powers of nature, but in most instances the hypertrophy increases, and by extending to the rest of the neck, produces those uterine displacements which have lately been studied too much without reference to their real cause. The patient cannot be kept to herself, because under increased fatigue of the sexual organs, or of the general system, a greater amount of irritation sets in, and the passage of a leucorrhœal discharge on an inflamed surface produces granulations, excoriations, and ulcerations, where primitively none might have existed.—*Lancet*, *August* 10, 1850, *p.* 173.

120.—USE OF THE SPECULUM.

By Dr. Robert Lee, F.R.S., &c.

[Dr. Lee in the following article states concisely the results of his observations during the last twenty-three years, on the use of the speculum in the diagnosis and treatment of uterine diseases. He says:]

In the first great class of organic uterine diseases, which comprehends fibrous, fibro-cystic, glandular, and all other tumours which are not malignant, I have derived little or no aid from the speculum in their diagnosis or treatment. When fibrous or other tumours are formed under the peritoneum, or between the muscular fibres, or under the lining membrane and distend the cavity, their existence can only be determined by a careful examination of the hypogastrium, and of the interior of the pelvis through the vagina and rectum. The uterus is usually felt large, hard, irregular, and the cervix shortened. Where these tumours have passed partially or completely through the os uteri, their size, density, the length and thickness of their roots, and the relations these bear to the os and the cervix uteri, can only be determined by the touch. I have never detected a small polypus within the os uteri, or hanging through it, which I had failed to detect with the finger. In cases of this description I have, however, repeatedly employed the speculum to ascertain the colour of the polypus, and the degree of vascularity of the investing membrane, which without ocular examination could not have been determined. The knowledge thus acquired was of no use in the treatment. In a case of fibro-cystic polypus of the uterus, which occurred at St. George's Hospital upwards of eight years ago, under the care of Mr. Cutler, the speculum was introduced, and we saw clearly the small cysts under the vascular covering membrane. The speculum was withdrawn, before the operation for the removal of the tumour had commenced. In a case of small glandular polypus in a sterile married lady, which I saw with Mr. Painter, the speculum was employed, and it made us acquainted with the colour, and more perfectly with the nature and diminutive size of the disease. The polypus was removed with the forceps, after the speculum had been withdrawn. In a similar case which I saw with Mr. Jonson, of Grosvenor place, the speculum was employed for the same purpose after the nature of the disease had been satisfactorily ascertained by the touch. The tumour was readily removed with the forceps after the speculum had been withdrawn. Very recently I saw a sterile married lady with Dr. Meryon, who had a small polypus hanging through the os uteri. In that case the speculum had been employed before the patient came to London, and for that reason alone I had recourse to it. The tumour presented the appearance of a large bean, was of a bright-red colour, like vascular tumours of the meatus urinarius, and bled freely when touched, though the surface was not ulcerated. The length and thickness of the root on which the speculum threw no light, had previously been ascertained with the finger. The forceps was passed through the tube, and the tumour removed; but it is now my conviction, that the peduncle would have been more effectually destroyed, had the forceps been passed up along the fore and middle fingers of the left hand in the usual manner. More recently, with Mr. Henry Charles Johnson, I removed a small polypus, hanging through the os uteri, with the forceps, in a most satisfactory manner, without the speculum altogether. In all large uterine polypi it is obvious that the speculum can be of no use, and that it would not enable us in any case to decide whether a tumour in the vagina was a polypus or an inverted uterus, a small portion only of the lining membrane of the uterus, in either case, being all that could possibly be presented to the eye. A case of large globular tumour in the vagina, now under the care of Mr. Cathrow, strikingly illustrates the truth of what now has been stated respecting the use of the speculum in the diagnosis of inverted uterus, and fibrous tumours.

In all the varieties of malignant disease of the uterus, scirrhus, fungoid cancer, and corroding or phagedenic ulceration, the speculum has given me no assistance whatever in their diagnosis and treatment, either in the early or in the advanced stages. I have never, in a single instance, failed to determine by the sense of touch, when cancer of the uterus had commenced; but I have repeatedly, after the most careful examination, both with and without the speculum, suspected that it would be developed, when the result proved that my fears were groundless. I am fully satisfied that the speculum does not enable us to decide earlier than the finger that cancer has commenced; and if it did so, as some maintain, and enable us to make applications to the os uteri, which could not be made without, not the slightest advantage would be gained in practice. When cancer of the uterus has advanced to ulceration, the speculum is not only useless, but positively injurious, and ought not to be used. In the year 1827, when I first became acquainted with the speculum, and saw it very frequently employed in a great public institution, a patient with ulcerated carcinoma speedily died from hemorrhage after the introduction of the bivalve speculum. In cases of ulcerated cancer, of the uterus, the best French writers have interdicted its use. "L'etat de la matrice elle-même," observes M. Teallier, "interdit quelquefois l'usage du spéculum; les ulcérations saignantes, et profondes du col, son énorme développement, les fongosités qui s'élèvent de sa surface empêchent et rendent même inutile ce moyen d'exploration." M. Pauly gives the same opinion, and relates a case in which the speculum produced extensive laceration of the vagina, and death in two hours.

Several cases of ulcerated carcinoma have come under my observation, in which the speculum and ignorance of uterine pathology appeared to have led to the commission of the most grievous mistakes. In one of these, even in the last stage, the speculum and caustic had been employed almost daily for months, and hopes held out of recovery, when the patient had only a very short time to live. In another case which I saw with Mr. York, where the os and cervix uteri, and a portion of the vagina, were all extensively disorganized by cancerous ulceration, the speculum and caustic were used, at first daily, and then twice a week for months, by the physician under whose care she came at last, without the slightest benefit. I have seen other cases analogous to these, and several others have been related to me which I had not seen.

From the age of maturity to the middle period of life, the uterus is rarely, seldom at least, comparatively with advanced age, affected with organic disease of any kind. Amenorrhœa, hysteria, dysmenorrhœa, menorrhagia, leucorrhœa, and various nervous affections local and constitutional, are those from which females chiefly suffer before the age of twenty-five or thirty. An examination of the physical condition of the uterus in unmarried women, either with or without the speculum, I have always refused to make, even when requested to do so, unless pain severe and almost constant in the region of the uterus existed, leucorrhœa or hemorrhage, which did not yield to treatment, and where the symptoms did not make me strongly suspect the presence of some displacement or organic disease. In unmarried women, whatever their rank or condition in life may be, the integrity of their structures should not be destroyed by the speculum, nor their modesty wounded by an examination of any kind without a necessity for such a proceeding being clearly shown. Even in married women, who are barren, or who have had children, it is unjustifiable on the grounds of propriety and morality, to institute an examination of any sort, unless the symptoms warrant the supposition, that the uterus is displaced, or is in a morbid condition, the nature of which cannot be determined by the symptoms alone. Numerous cases of leucorrhœa in young unmarried females, where rational constitutional and local treatment is adopted, perfectly recover, where no examination is made.

In cases of obstinate leucorrhœa, I have often employed the speculum in married women after I had failed to detect the existence of disease by the ordinary mode of examination. In some of these cases, there has been seen an unusual degree of redness of the os uteri, sometimes affecting the whole, and at other times limited to the inner margin, with or without swelling. The white viscid discharge has been seen issuing from the os uteri. I have never seen ulceration of the orifice of the uterus in such a case, and the condition of the interior of the cervix I have never been able to demonstrate either with the bivalve or any other speculum; nor do I believe that, in the ordinary condition of the os uteri, it is possible to see the inner surface of the cervix to any great extent by any means. Where the orifice is unusually open, the lips may be sometimes separated to a small extent; but never, as far as my observation goes, to show more than an extremely small part of the interior of the cervix. In some cases of chronic leucorrhœa, with redness and swelling of the os uteri, I have known the speculum and caustic employed at short intervals for many months without the slightest benefit, but the leucorrhœa has ceased as the general health has been restored by constitutional and topical treatment. In a case of sterility with obstinate leucorrhœa, which has very recently occurred, the injection into the cavity of the uterus of a weak solution of sulphate of zinc, caused the most sudden and excruciating pain, and collapse of the nervous system, which had nearly proved fatal.

Sometimes one or both lips of the os uteri are in the condition which is usually called hypertrophy, and which has no relation to cancer. One lip perfectly smooth, and not unusually hard or irregular, as in cancer, protrudes beyond the other to the extent of half an inch, or three quarters, or more. I have known this state mistaken for polypus, seized with the forceps, dragged down to the orifice of the vagina, and removed with the knife or scissors. At other times both the lips are swollen, nodulated and fissured, and the mucous membrane covering them intensely red, with an appearance of superficial excoriations or granulations, which are elevated above the surrounding surface. These apparent granulations are usually considered and treated as ulcers of the os and cervix uteri, but they do not present the appearances which ulcers present on the surface of the body, or in the mucous membranes lining the viscera, and they are not identical with the granulations which fill up healthy ulcers. They present the appearances often observed on the tonsils, and which are said to be ulcers, but which are not.

This granular state of the os uteri, in which the diseased mucous membrane is raised above the level of the surrounding surface, and not depressed like ulcerations in all other parts of the body, is not dissimilar to granular disease of the mucous membrane of the eyelids, the most aggravated cases of which are well known to be produced by the abuse of escharotic applications. These morbid states of the os uteri most frequently indicate the existence of some disease of the nabothean glands, penniform rugæ, lining membrane or walls of the uterus, or of the general health, which lies far beyond the reach of the speculum and caustic. The state of the orifice of the urethra not unfrequently indicates the existence of disease of the prostate gland, or of the urethra itself near the bladder. Such is the case with the os uteri, and its red swollen hypertrophied, granular state, often indicates morbid conditions of the constitution, of the glands, mucous membrane, and walls of the uterus, on the nature, diagnosis, and treatment of which little or no information is derived from the use of the speculum. In these cases, I have known leeches, scarifications, caustic, and the speculum employed upon a great scale, and sometimes I admit (if the reports of patients are always to be trusted to) with apparent temporary relief. Gently rubbing the os uteri with lunar caustic through the speculum, a few times at long intervals has appeared to effect all the good which such local treatment can accomplish. It is impossible that any disease of the os uteri, or any other part of the body, can require twice or thrice a week for six or nine months, the alternate applications of leeches and caustic through the speculum, in the manner which has recently been recommended and practiced; and it is my conviction that rational constitutional treatment and injections, sedative and astringent, will in these morbid conditions of the os uteri succeed ultimately in producing more successful results than escharotics.

In some of these cases, instead of adopting the course which I have now recommended, for the removal of these diseased states of the uterus, potassa fusa has been applied to the os and cervix uteri, a piece of potassa fusa has been run into the cervix and twisted about in all directions, which has produced sloughing and complete disorganization of the parts. In one case, which I saw in a young married lady, this had been done repeatedly, and the patient had nearly perished from peritonitis and the sloughing which followed. I saw this lady some months after, with her general health deeply injured, the lips of the os uteri partially gone, and the parts cicatrized and contracted. I sought in vain for an explanation of the grounds of such practice, and recommended greater caution in the use of potassa fusa; but the advice was thrown away. Twice since, the same experiment has been repeated by the same individual, and with the same results. One of the most learned fellows of this society has communicated to me the history of a case which came under his observation, in which sloughing followed the application of potassa fusa to the os uteri. The cervix uteri presented the appearance of a hard, pale, shining cicatrix. A narrow chink only was to be seen, into which a small bougie could not enter. The orifice was greatly contracted, if not absolutely closed. The eminent pathologist who has communicated to me the history of this case has justly observed, "That if potassa fusa be introduced into the os and cervix uteri, and turned firmly round, or be applied severely, as has lately been recommended, there must be a partial death and destruction of the part, and a state of actual mortification or gangrene induced; and this injury nature can only repair by sloughing, ulceration, cicatrization, and contraction, if not a complete closure of the cervix uteri."

An English physician, eminent in science, after visiting an hospital in Paris, a few days ago, wrote as follows, to a friend in London:—"I have seen some very wonderful things which I will recount to you; a large speculum being passed up to the neck of the uterus, red hot irons are inserted into the neck, right into the os, which is also cauterized on its surface, and as soon as it is done the creatures get up and walk away, and never seem to feel it at all. To-day M. —— found an os wider open than it should be, and so to satisfy his curiosity, he poked an immense long pair of forceps almost three inches into the cavity of the uterus: yet more, some days ago, I saw him pass his stick of lunar caustic into the os, a little way into the neck, then break it off and leave it there." If such practices as these, here described, were only employed in Paris, from whence all the pretended recent improvements in uterine pathology and therapeutics have issued, I should not now have considered it necessary to denounce them to the Royal Medical and Chirurgical Society.—*Med. Chirurg. Transactions, Vol.* xxxiii., *p.* 260.

121.—SUPPOSED FREQUENCY OF ULCERATION OF THE OS AND CERVIX UTERI.

[In a letter to the editor of 'The Lancet,' Dr. Tyler Smith says, with regard to a report in which Dr. Locock is unable to express his belief, "that ulceration of the neck of the uterus must be a very frequent disease:"]

Dr. Locock has assured me he did not make any such assertion in his speech on the above occasion, but what he really did say, was, that the state of the os and cervix uteri, described by Sir Charles Clark, *and to which the term ulceration has been erroneously applied*, was common enough. It is well known, that all the best writers on the diseases of women in this country, since the publication of Sir Charles Clark's work, have recognised the form of leucorrhœa depending on inflammation of the cervix.—*Lancet, June* 15, 1850, *p.* 718.

122.—ORIGIN, CAUSE, AND NATURE OF CHRONIC OVARIAN TUMOURS.

By Dr. E. J. Tilt.

Cellular tissue, which resembles serous membranes in its functions as well as in its structure, which separates the organs one from another, and binds them together in one harmonious whole, has, in each of its multitudinous cells, the power of secreting and absorbing the serum by which they are filled. If, therefore, a ball or any foreign substance be forced into the body, the cellular tissue of the part where it is deposited forms around it an adventitious serous cavity, secreting a serous fluid: and thus the foreign body may remain for years isolated, and therefore harmless.

In a similar manner, if from any given cause (and there are many,) blood be forced from those channels wherein it was destined to run its continuous course in the substance of the brain, lungs, or any other of our tissues, that ubiquitous cellular tissue receives it, and from itself forms a serous membrane to surround it on all sides; and as the substance thus enclosed is homologous to the inclosing body, it is sometimes completely absorbed, and the accidental cavity diminishes and disappears. Sometimes, however, the cavity remains, secreting and absorbing like any natural serous cavity; and when found by the anatomist it no longer reveals to him the origin and cause of its existence—the blood clot. In other cases this blood clot is only partially absorbed, and thus reveals the origin of the cyst, by its colour and appearance. We may therefore infer that wherever cellular tissue exists, there an hematic cyst may be developed. From the uncontested properties of the cellular tissue, we may also derive the origin of many other accidental cysts, so frequently met with; for every individual areola of this tissue secretes and absorbs: and as it holds communion with the neighbouring cells, we find them all alike distended in œdema and anasarca. But certain areolæ are cut off by inflammation, or some other cause; and thus arises a serous cavity, the increase of which will depend on the nature of the organ wherein it is formed, as well as on a variety of other causes: cysts of the eyelids and of the mammæ, the synovial bursæ of the patella, the ganglia, or tumours formed on the sheaths of tendons, may be thus satisfactorily explained.

We have thus declared two origins for accidental cysts, as depending—1. On the nature of the areolar tissue, which permits one or more of its cells to set up on its own account; 2. On an hematic origin. We may also add, that whereas there is a great uniformity in the liquid produce of natural serous cavities, the serum being transparent, light-coloured, and of a low specific gravity, there is also uniformity in the nature of the fluid contents of all accidental serous cavities, the liquid being more complex in its nature, of a more considerable density, and often mixed with fatty substances and cholesterine. Applying to the subject under consideration, these deductions from the laws of general pathology, we shall have at least the origins of ovarian cysts; for cellular tissue enters into the structure of the ovary, and blood may also be extravasated into its tissue: and admitting, with De Graaf, and with Logger, that, besides the Graafian follicles there are minute vesicles in the stroma of the ovary—a fact lately confirmed by the microscopic researches of Henle—we may believe that they are sometimes the seat of intra-ovarian-fibro-serous cysts; while extra-ovarian, which are always fibro-serous, and those formed in the broad ligaments, can only be thus explained Dupuytren, Chaussier, and others, believed that all ovarian cysts were adventitious: but a slight inquiry into the nature of the ovaries will soon convince us that these are not the only original seats of ovarian cysts, and that we may believe, with Cruveilhier, professor Stoltz, and many other writers, that they often originate in the Graafian follicles. The ovaries are cellular in their structure: and it was necessary that they should be so, to render them fit receptacles for the human germ.

Every month during the productive period of a woman's life, is marked by the enlargement of a follicle, which may or may not burst. If it burst, the remaining cavity will be filled with blood, which may or may not have been absorbed when a succeeding menstrual effort comes to give an increased energy to any healthy or morbid action in which the ovary may be engaged. We have, therefore, in the cystic structure of the ovary, and in the monthly fertility of its soil, additional reasons for the frequency of ovarian cysts; and the possibility of uncontrolled distension, which, from their situation, they necessarily enjoy, is a reason for their increased hydatids.

Very little is known of the origin and causes of hydatid formation in general, and, in particular, of hydatid ovarian cysts. These bodies are formed in fibro-serous cysts; and although the cause of their production is unknown, they may very likely depend upon some unhealthy condition of the blood; but still we know not in what that condition may consist. Thus it has been observed that, in almost every instance of hydatids, the general health has been for a long time previous considerably deranged; and it appears that Dr. Jenner produced hydatids and flukeworms in rabbits, by feeding them exclusively on succulent food. These experiments acquire additional importance since the publication of Dr. Schleisner's account of the diseases peculiar to Iceland; its corn, esculent roots, and fruit, will not grow in that island; the inhabitants eat little bread, or vegetables, and live upon dried fish, dried meat, butter, tallow, train oil and blubber. The probable result of this exclusively animal diet is a frequency of hydatid growths unknown in any other country. Hydatids formed one-eighth of the cases enumerated, and one-sixth part of those observed by Dr. Schleisner, who remarks that in one parish he met with two or three sufferers from this disease in every family.—(Review of Dr. Schleisner's book, 'Brit. and For. Med. Review,' Jan. 1850.)

Unassisted by an imposing array of facts to account for the origin of these productions, we must have recourse to analogy, and to what we have learned from comparative physiology respecting the generation of our tissues. In explanation of these laws, can we do better than borrow from an illustrious countryman, who has already raised himself a name which must descend to posterity, Professor Owen, who in his valuable lectures on generation, lately delivered at the Royal College of Surgeons, says—"The primitive forms of all tissues are free cells, which grow by imbibition, and which develope their like from their nucleus of hyaline. All the animal tissues result from transformations of these cells. It is to such cells that the acephalocyst bears the closest analogies in physical, chemical, and vital properties. When the infusorial monads are compared to such cells, and man's frame is said, by a figure of speech, to be made up of such monads, the analogy is overstrained, because no mere organic cell has its mouth, its stomach, its pulsatile sac, &c. So also it appears to me that the analogy has been equally overstrained, which makes the acephalocyst a kind of monad, or analogous species of animal.

We may, with some truth, say that the human body is primarily composed, or built up of acephalocysts: microscopical, indeed, and which, under natural and healthy conditions, are metamorphosed into cartilage, bone, nerve, muscular fibre, &c. When, instead of such change, the organic cells grow to dimensions which make them recognizable to the naked eye, such development of acephalocysts, as they are then called, is commonly connected in the human subject with an enfeeblement of the controlling plastic force, which, at some of the weaker points of the frame, seems unable to direct the metamorphosis of the primitive cells along the right road to the tissues they were destined to form, but permits them to retain, as it were, their embryo condition; and to grow by the imbibition of the surrounding fluid, and thus become the means of injuriously affecting or destroying the tissues which they should have supported and repaired. I regard the different *acephalocysts*, therefore, as merely so many forms or species of morbid or dropsical cells.

"The question which remains to be solved is, how the parent hydatid originates; two modes may be conjectured; either it is the result of the development of an organic granule, nucleus, or cell, of the animal invested, according to the hypothesis of fortuitous or spontaneous generation; or it is developed from an impregnated germ-cell detached from a pre-existing acephalocyst, and potentially endowed with the special mode and direction of the plastic force which issues in the repetition of the same organic form as the animal from which it proceeded. Analogy points to the latter as most accordant with actual physiological experience."

Whatever may be the cause of these singular bodies, when once originated they may for years continue to re-produce similar bodies. The late Dr. Ryan has recorded a case in which hydatids were retained in utero so long as fourteen years.

Piliferous cysts.—In some rare instances the impregnated germ falls not into the fallopian infundibulum, but remaining attached to the ovarian birth cell, gradually appropriates to itself the tissue of the ovary, and so distends it as often to attain a considerable size. These fœtal cysts may remain stationary for years. Sometimes the fœtus is reduced to a kind of mummy, but at others it undergoes decomposition, the soft parts being converted into various kinds of fatty matter. While portions of skin of the fœtus become attached to the interior of the cyst, reproducing by its bulbs the hair which is so often found in considerable quantities, the more solid parts, such as the bones and teeth, remain to indicate the origin of the cyst.

We are thus led to infer, that piliferous cysts are sometimes only fœtal cysts, wherein the greater part of the body has undergone decay. But does this explanation hold good in all cases of piliferous cysts? M. Pignè, who has paid great attention to this subject, does not hesitate to assert that all piliferous cysts are either the result of extra-uterine pregnancy, or of a malformation; that, for instance, when piliferous cysts are found in girls of a tender age, or in young boys, we must believe them to be relics of some other individual contemporary with one in whose body they are implanted; and that it was in an early stage of their existence that somehow or other one of the two became included in the other. Those who must have an explanation of the fact, and who can never, as Montaigne so quaintly says, "make up their minds to lay quietly their heads on the pillow of doubt," may admit this explanation, but it is surely better to confess our ignorance than attempt to explain the inexplicable. If we had merely to account for those piliferous cysts growing in the vicinity of the shin, in the scalp, the eyelid, the mamma, and the scrotum, we might, as Carswell suggests, consider the hair they contain as arising from accidental development, as it grows from the anterior portion of these cysts which is lined by the reflected cutaneous tissue; but such an explanation could not account for the hair and teeth found in the ovaries of virgins, in the coats of the stomach and of the bladder of man, in bronchocele as mentioned by Celsus, in the abdomen of a boy by Dupuytren and Mr. G. W. Young, in the lungs by Mohr, in the brain by Morgagni, and in the orbit by Barnes. (Med. Chir. Trans. vol. iv.)

Without pretending to explain the fact, we must observe that in all well-authenticated cases the interior of the cyst has been found to be lined with a substance like the skin, with bulbs producing hair. Cruveilhier, Velpeau, Carswell, and many others, have seen cysts partially lined with skin; in a case recorded by Bricheteau, the cyst was entirely so lined, and this must also have been the case in the instance quoted by Morgagni, from the author of an opuscule, (*de Ovarii tumore pilosa, Liepsick*, 1735) who does not scruple to compare the cavity of the cyst to the scalp. It must be a tissue similar to skin, for it not only secretes fat and sebaceous matter, but hair has been repeatedly seen to grow from its bulbs, horny productions have been known to spring from it, dental sacs and teeth have been found rooted in it: and these are all epidermoid productions. How a fragment of skin could thus be found we cannot explain, but it seems as if the vegetative life adherent to each of the germ-cells which constitute our frame, were able sometimes to produce the "horn layer," (mucous layer), or that portion of the germinal layer which covers the embryo, and is the foundation of the non-vascular and nervous tegumentary appendages. Here, again, we willingly quote from Professor Owen's second lecture on the generation and development of invertebrated animals, in order to bring the light of comparative physiology to bear on the more abstruse points of pathology.

"In many classes of the invertebrate animals the retained spermatic force operates with such energy as to form a new individual from a secondary, tertiary, or quaternary derivative germ mass. How this is done we know not; suffice it to say that it is done. The completion of an embryonic or lowest form by the development of an ovarian germ-cell, as in the aphis, without the immediate reception of fresh spermatic force, has never been known to occur in any vertebrate animal; in the vertebrate animal, the whole of the spermatic force, originally diffused amongst the cells or nuclei of the germ mass, is exhausted in the development of the tissues and organs of the individual, in the mysterious renovation of the spermatic power in the male, by a special organ; and in the development of ova or cells prepared for its reception in the female. But it now and then happens, even in the highest of the vertebrata—the human species—that the ovarian cells sets up the process of embryonic development, but without sufficient of the spermatic and plerotic power to complete even a lowest form: some crude materials of the embryo, are the only result,—teeth, it may be, or hair, with irregular amorphous ossifications, such as are met with occasionally in ovarian cysts."

Whatever may be the origin of such epidermoid appendages, they are more frequently found in the ovary than in any other organ, and Meckel asserts that they are more frequently found on the right side. They are met with at all ages; in 49 cases collected by M. Pigné, 5 were not 12 years old, the age of 6 varied from 6 months to two years, 4 were full-grown fœtuses, and piliferous cysts were also found in the ovaries of 2 fœtuses which had been cast off before the end of the ninth month.

These cysts may communicate with the bladder, as in the case given by Suetin, (An. de Med. Belge, 1838), where a tooth was found forming the nucleus of a stone in the bladder. Hair has likewise been passed in the urine, by a communication between the bladder and a piliferous cyst, but Magendie has published cases of gravel, wherein hairs were passed mingled with the usual saline conditions. Where did these hairs come from? Were they secreted by the kidneys?

It is well to know that such productions are not peculiar to the human species, and that the hair of the cow and the wool of the sheep have been found in the ovaries of these animals.

Penada found a fatty bag containing two bunches of feathers, 33 in number, in the breast of a young cock.

[Considering the exciting causes of ovarian tumours, Dr. Tilt says,]

Before attempting to show how the causes of ovaritis produce chronic ovarian disease, it is necessary to observe that most morbid anatomists admit the inflammatory origin of adventitious cysts. Without burdening ourselves with numerous citations, we shall quote the opinion of one of our most eminent authorities on such matters. "Although the origin of adventitious serous cysts is in a great many cases involved in much obscurity, there are good reasons for believing, that it is similar in kind to that of adventitious serous membranes; that is to say, that these cysts originate under the influence of causes which excite inflammation of the cellular tissue in circumscribed portions of organs." (Carswell's Pathological Anatomy.) We only affirm, then, that cysts are formed in the ovary by a process similar to that which produces them in other parts of the body; and we also add that, as under healthy circumstances, the ovary devotes its whole energies to bring the menstrual cysts to perfection, so under the influence of inflammatory causes it devotes the same energies to produce encysted growths of a morbid nature. In no system is inflammation more susceptible of being limited to a *very* small space than the sexual system, for the neck of the womb may be severely inflamed without the body in the least participating in it. Huguier affirms that the follicles of the uterine mucous membrane (the ovula of Naboth ?) are sometimes found dilated and inflamed, while the other portions of the mucous membrane do not participate in the inflammation. Cruveilhier and other observers have sometimes seen one uterine vessel full of pus, offering distensions about the size and shape of small olives: the fallopian tubes may also be independently inflamed; one or both ovaries may be so; a single ovary may be inflamed in its stroma, in its peritoneal coat, in certain portions of its tissue, or in one menstrual cell which may alone be found containing pus or well organized false membranes. When we talk of partial ovaritis producing the different forms of chronic ovarian disease, we merely affirm that inflammation developes, in a morbid degree, the structural tendencies of our organs. Inflammation of the bony structure will cause a greater deposition of saline particles in their cellular texture, that of the serous membrane an increase of the usual fluids and other products; in like manner partial ovaritis developes the peculiar cystic structure of the ovaria by exaggerating the prolific tendency of its elementary tissues. When once the cyst is originated, and the balance between secretion and absorption on its internal surface is interrupted to the advantage of the secreting powers, there is no reason why exhalation should not continue predominant in artificial encysted cavities, as well as in those cavities which are natural. We believe inflammation to be as much the key-stone of ovarian disease as it has been proved to be of uterine pathology, and of the structural lesions of other organs. We believe that it lends a hand in the formation of almost every ovarian cyst, even when that inflammation is too circumscribed to be detected by any means we have at our command; and we thus admit that it is alone a cause sufficient for the very numerous cases of fibro-serous variety, and of ovarian growths, even when they are more or less solidified into cartilage, fibrous substance, or bone. If, however, the blood be loaded with constitutional impurities with the occult seedlings of cancer, or the original elements of that protean diathesis called scrofula, the existence of which is clearly established, however difficult it may be to define it characteristically, then, if the ovaria are under the influence of any of the causes of ovaritis, they will withdraw from the blood which flows continually towards them the elements of disease, and will so assimilate them as to build up cancerous (colloid) encysted ovaria. The warp and woof of the cancerous tissue is afforded by the primitive structure of the organ. The cancerous diathesis finds the rough materials which are to be employed, and inflammation is the all-powerful agent which works up this rough material into the tissue of the organ. Thus we account for the production of areolar cancerous ovarian cysts.

When the follicular multicystic forms are found to exist in patients presenting signs of scrofulous tendency, we can then in a similar way account for the strange and different productions we have described; but in many cases we cannot explain them by any constitutional affection. We must, however, bear in mind that it is but fair that the organ which has within it sufficient energy to secrete the living man should also have the power of giving spontaneous growth to productions of an inferior nature; and that in the whole history of the ovary there is an uniform striving for production, which is equally shown by its physiology and its pathology; and thus, if the organs of increase are useless for fruitful progeny, they will often teem with spurious growths. The streams of living productivity having been once made to rise in those hidden wells of our existence, they cannot be dried up. They will often go on producing imperfect growths or forms which, being perfect, can reproduce themselves; and so it is throughout the whole creation.—*Med. Gazette, Aug.* 9, *p.* 234, *and Oct.* 18, 1850, *p.* 660.

123.—DIAGNOSIS OF OVARIAN DROPSY.

By I. B. Brown, Esq.

[Briefly alluding to the diseases simulating, and which might be mistaken for, ovarian dropsy, we have, says Mr. Brown,]

1. Retroflexion and retroversion of the uterus. 2. Tumours of the uterus. 3. Ascites. 4. Pregnancy. 5. Pregnancy complicated with ovarian dropsy. 6. Cystic tumours of the abdomen. 7. Distended bladder. 8. Accumulation of air in the intestines, especially if there has been chronic peritonitis leaving some ascitic fluid. 9. Enlargement of the solid viscera of the abdomen, the liver, spleen, and kidney. 10. Accumulation of fæces in the intestines.

Respecting the first, ovarian dropsy, when it is first detected in the pelvic cavity, between the rectum and vagina, may be confounded with retroversion of the uterus, but a careful examination of that organ will decide the point, for, in retroversion, the os uteri is thrown forcibly forwards and upwards, and the wound is immovable and painful; not so in ovarian dropsy. Retroflexion of the uterus, which has been well described by Dr. Rigby, more closely resembles ovarian dropsy, but on examination by the uterine sound, and by careful manipulation, the fundus of the uterus can be placed in its natural position.

2. Tumours of the uterus, particularly those with distinct peduncles, may at first be mistaken for ovarian dropsy, but a careful examination, first of the uterus itself, and then of the tumour, with the absence of fluctuation and elasticity, will soon determine the point.

3. Ascites may be, and is, more generally mistaken for this disease. But in ascites the general signs are, swelling of the extremities, and consequent inability to walk; disturbance to digestion, inadequate action of the liver: respiration, and the action of the heart, are all sensibly affected, both because the thoracic organs are themselves sometimes the seat of disease, and also because those organs are compressed upwards by the unusual elevation of the diaphragm. This disease is usually ushered in by irregular or suppressed action of the liver or kidneys, or by chronic peritonitis; the effusion of fluid is general over the abdominal cavity. On placing the patient on one side, the fluid depends to that side, and the sound of the bowels, on percussion, can be heard over the upper side. At the earlier stages, the effusion is seated at the depending portion of the abdomen; on applying pressure firmly over this depending portion the fluid will be dispersed, and on percussion the sound of the bowels can be heard. The shape of the abdomen is also altered by any position, as upright or horizontal; the fluid, in fact, occupies the cavity of the abdomen from ensiform cartilage to pubes—that is, the upper, middle, and lower thirds of the abdominal cavity. On placing the patient in the upright posture, the fluid descends so as to render the presence of the intestines perceptible in the upper third of the abdomen.

4. Pregnancy is sometimes mistaken for ovarian dropsy, and in the first two or three months of utero gestation, its discrimination often requires great tact and careful examination, for in ovarian dropsy you sometimes have enlarged mammæ, with dark and extended areolæ around the nipple, and also moisture from the nipple itself, with suppression of the menstrual discharge and morning sickness. A case lately came under my notice, where the patient had been pronounced, by more than one medical man, pregnant; but as constitutional derangement increased, and she did not increase in size so fast as was usual in pregnancy, she consulted me, and believing that it was a case of ovarian disease, with that peculiar thick, cheesy matter already referred to, I examined the uterus by the sound, and ascertained that no pregnancy existed. Subsequent tapping proved the correctness of the diagnosis. I was also called suddenly to another lady, who had been most carefully examined by a distinguished obstetric physician, (not generally mistaken in his diagnosis,) who declared that she suffered from ovarian dropsy, and yet, on my arrival, I found her in premature labour of five months' pregnancy, induced probably by the examination she had undergone.

Pregnancy complicated with Ovarian Dropsy.—Now this is perhaps the most difficult of all to distinguish and determine. I have met with three cases of this rare complication. In one I was called to see the lady pregnant with her second child. I found her generally ill and weak, complaining of the enormous size of her abdomen, and satisfied in her own mind that she should have twins. At the proper period labour came on, and the child was born without difficulty: but on placing my hand externally, to grasp the uterus, I found I could not feel it, for the pelvic cavity was filled by a soft, elastic tumour, and the uterus had ascended out of the pelvic cavity, and was above this tumour. On introducing my hand into the vagina, and endeavouring to reach the uterus, to remove the placenta, and pressing my other hand externally over the uterus, I had the pleasure to feel the tumour, which I felt was an ovarian cyst, suddenly rupture, and discharge its clear, amber-coloured fluid down the side of my arm. The uterus now descended, the placenta was removed, and a very tight bandage applied, and kept on for several weeks; and on a subsequent confinement, not a vestige of this tumour could be felt. In the second case, I pronounced my opinion to be, that there was ovarian dropsy, independently of pregnancy. This patient was safely delivered of a full-grown child, and subsequently I tapped the cyst, removed sixteen pints of fluid, and applied tight bandaging. This patient suckled her infant for twelve months. In the third case, the patient was delivered in the country, and came to me directly after her confinement. Tapping and pressure were resorted to successfully.

5th. Cystic tumours of the abdomen are by far the most difficult to discriminate from ovarian dropsy, and it is only from the earliest history and position that we can draw any probable conclusion; and in the enlarged forms of these tumours it is extremely difficult to diagnose accurately.

6th. Distended bladder may be, and has been, mistaken for ovarian dropsy. A case of this kind came under my notice last year. A young lady, aged twenty-three, came up from the country, stating that she had been under treatment for four months, for "falling down of the uterus," but that during the last month she had become very much enlarged in the body, and her medical attendant thought she was suffering from ovarian dropsy, and therefore she consulted me. I found, on examination, a round smooth tumour, the size of a fœtal head, rising up from the pubic region, with distinct fluctuation. She stated that she had passed but very little urine for some weeks, and then only in very small quantities at a time. On examination per vaginum, I found a retroverted uterus, the os and cervix pressing firmly up against the neck of the bladder. On replacing the uterus by the uterine sound, and pressing on the tumour through the abdominal walls, urine escaped through the urethra; I then introduced a catheter, and drew off seven pints of dark, offensive urine, and the tumour disappeared never to return.

7th. Accumulation of air in the intestines, especially, if there has been chronic peritonitis, leaving some ascitic fluid. I shall presently illustrate this more fully by relating a case in detail.

8th. Enlargement of the viscera of the abdomen, especially of the liver, of the spleen, or of the kidney. I could illustrate this subject by mentioning some curious cases of error in diagnosis, in connexion with each of those organs, but I shall merely mention, that in these cases we generally have severe constitutional symptoms pointing out the nature of the disease.

Mr. Harvey related a case of great interest last session at the London Medical Society. It was supposed to be a case of ovarian dropsy: ovariotomy was determined on, but not executed, and when the patient died, the disease was found to be an hydated cyst, connected with the liver, no ovarian disease whatever existing.

9th. Accumulation of fæces in the intestines is another form of disease not unfrequently mistaken for ovarian dropsy. I once met with a case of simple encysted ovarian dropsy, which, at the earliest growth, was considered by a very distinguished surgeon in London to be an accumulation of fæces, and yet the subsequent history of the disease, terminating in tapping, and followed by pressure, not only proved the true character of the disease, but also resulted in a permanent cure.—*Lancet, July* 13, 1850, *p.* 47.

124.—NEW OPERATION FOR OVARIAN DROPSY.

By I. B. Brown, Esq.

[Mr. Brown, in bringing this operation before the Westminster Society, stated the difference from that of Mr. Bainbridge, as it enabled the patient to lie on her back on water cushions, allowed the wound to be dressed and cleaned readily and without fatigue, and also enabled the surgeon to make pressure on the cyst by strips of plaster carried round the abdomen. He placed the patient on the edge of the bed in the horizontal position, and then drawing an imaginary line from the umbilicus to the superior spinal process of the ilium, and dividing it into thirds, he made an oblique incision from above downwards, and from within outwards, through part of the middle third and into the outer third.]

The oblique incision was about three inches. He (Mr. Brown) dissected carefully through the muscles and fascia down to the peritoneum; through this could be seen the whitish shining coat of the cyst; he then made another smaller incision at right angles to the first, and dissected down to the peritoneum; this incision was about an inch and a half in length. At the point of the angle a large-sized trocar was introduced, and the fluid drawn off. The canula being kept in, the peritoneum was divided, and reflected back; then the cyst was stitched by sutures to the aponeurotic tendon of the external abdominal oblique muscle, carefully avoiding the other structures; these sutures were nine in number, and were so arranged as to secure completely the cyst on all sides to the tendon of the muscle, and prevent any escape of the fluid from the cyst into the peritoneal cavity; the canula was now withdrawn, and by means of a pair of scissors the cyst was divided between the sutures; a pledget of lint, soaked in oil, was then introduced into the wound, and changed occasionally, and some adhesive straps placed across the abdomen, to keep up gentle pressure. Not a single bad symptom, referable to the operation, followed. The second operation was performed in a similar manner, and in the same position, but a piece of the cyst was cut out, the fluid being first evacuated, and then the remaining portion of the cyst was allowed to return to the peritoneal cavity, the external wound being closed; pressure was applied over the whole abdomen by means of adhesive strapping and flannel bandage. This operation was intended to imitate spontaneous rupture, and was only to be recommended where the fluid was not of an irritating character.—*Prov. Jour.—Monthly Journal of Med. Science, August*, 1850, *p*, 179.

125.—DISPLACEMENT OF THE OVARY.

By Dr. Edward Rigby

During the last three years (says Dr. Rigby) I have had occasion to notice several instances of a painful affection of the pelvic region, which I had not observed before, and which as far as I know, has not yet been described. It is characterised by intense and peculiarly sickening pain about the sacral region, extending to one or other of the groins, and coming on in paroxysms of such agonising severity as to render the patient perfectly frantic with the intolerable suffering. In some patients the intermission of case were nearly or quite entire; in others, the pain, although divested of its characteristic intensity, never wholly abated. The source of the pain was evidently connected, directly or indirectly, with the rectum, for the passage of fæces was frequently attended with some difficulty, and always with great suffering.

According to the patient's feelings, it seemed as if a partial obstruction existed somewhere up the rectum, the smallest pressure upon which, by the passage of fæces, was sufficient to bring on a paroxysm of this much dreaded pain. At other times, she could scarcely tell what had been the exciting cause of the attack: for, like a fit of tic douloureux, it would frequently come on from no assignable reason, and cause her the severest sufferings for some hours.

Patients describe the pain as being quite peculiar, and of a sickening and utterly intolerable character, such as they had never before experienced; indeed, from the descriptions which one or two have given of it, I should presume that it closely resembles the intense and peculiar suffering which patients describe in cases of orchitis. The pain was usually attended with great throbbing, and with a painful sense of forcing, or distension of the tender part, amounting almost to bursting, like something strangulated.

The menstrual periods have always been attended with intense pain, particularly during the early part of the discharge, though this varied a good deal in different patients, and (as far as I have seen) the discharge was invariably attended with exudations and small coagula. At these times the whole lower part of the abdomen was frequently tender to the touch, and more or less fever was generally present, probably arising in part from the degree of suffering which had been induced. The tongue always showed the dry short-napped fur which is so constantly seen in cases of disease, or displacement of the pelvic viscera; the digestive organs were much deranged, and not unusually the stomach was extremely irritable.

On making a vaginal examination, she would frequently wince, and complain as soon as the finger touched the os and cervix uteri; but a little care quickly sufficed to show that these parts were not morbidly tender, but that pain was produced by pressing them against the tender spot which was behind and to one side, in the direction of one or other of the sacro-iliac synchondroses, or sacro-ischiatic notches. On passing the finger, therefore, behind and to one side of the cervix, and pressing against the wall of the vagina in the above-mentioned direction, the painful spot is at once reached, and sometimes a slight degree of hardness is perceived.

On examining per rectum, the finger soon reaches the same acutely painful spot which had been felt per vaginam. The patient dreads the slightest touch of it, however carefully applied. It is evidently a convex body, like an enlarged gland, though usually softer, situated in the recto-vaginal pouch; it is moveable, if the patient can bear a sufficient amount of pressure for that purpose, and usually one or more vessels are felt throbbing when the finger presses upon it. The ovary is generally larger than natural, being more or less swollen from the strangulation produced by its displacement; and when the swelling is considerable, not only will pain be produced by pressing in the groin of the same side, but the ovary will be distinctly moved upon the finger per rectum. From the fact of its mobility can be explained the circumstance of our being able to feel it sometimes lower in the pelvis than at others, and why the patient is in greater suffering when it is so, than when felt higher up. Hence the passage of a solid mass of fæculent matter is attended with fearful sufferings; the ovary is pushed down by the fæcal mass as it descends through the rectum, until its attachments are put considerably on the stretch; a further amount of swelling is produced by the state of strangulation, and, in this condition, the fæcal mass is at length forced past, to the indescribable agony of the patient, frequently leaving her in severe pain for many hours afterwards.

In other cases, the ovary is nearly or quite fixed, having apparently contracted adhesions to the neighbouring parts.

It is not easy to speak decidedly as to the cause of this displacement, but I have chiefly, or almost solely, observed it among women of a lax, flabby habit, prone to passive menorrhagia, leucorrhœa, and abortion, but most particularly where the uterus has been retroverted. I have long since pointed out, that ovarian irritation or inflammation is a frequent result of retroversion in the unimpregnated state, arising probably from the tension to which the broad ligaments are exposed, and consequent engorgement of the ovary.

The diagnosis is not difficult, for the pain is quite peculiar. It is of a forcing, throbbing character, so sickening and utterly intolerable, as to be entirely different to any other pelvic pain with which I am acquainted. Its seat is referred to the upper and posterior part of the vagina, usually somewhat to the left side where the ovary can be felt, especially upon examination per rectum.

The direction in which we can best reach the painful spot will guide us as to applying leeches per rectum or vaginam; they pretty certainly produce much relief, although so long as the displacement continues, it cannot be more than temporary. The grand object necessarily must be to restore the ovary to its natural position, and this, whether connected or not with retroversion, will be best obtained by the prone position. The patient soon learns by experience what amount of lying forwards will be required, but, as in cases of retroversion, it is generally found necessary to assume an extra degree of prone position for a few minutes (knees and elbows) previous to lying down upon the prone couch.

On making an examination per vaginam, one might have been induced to suppose that the cervix uteri was the part affected, from the intense pain which was produced on touching it; but a little attention sufficed to show, that the cervix itself was not the source of her pain, but had only produced pain when pressed against the painful ovary. The ovary itself was felt most distinctly both per vaginam as well as per rectum. Its position varied a good deal at different times; when in most suffering it was low in the recto-vaginal pouch, nearly corresponding to where the fundus uteri is felt in a case of retroversion. After using the prone position it receded considerably, and her sufferings diminished in proportion. The case was one in which I could do but little while she was an out-patient beyond attending to the general health. I therefore admitted her into the hospital for the purpose of having leeches applied, and for the sake of ensuring that entire amount of rest in the prone posture which her symptoms required. This position always relieved her, but a decided impression was not made upon the swollen throbbing ovary until the application of leeches.—*Med. Times, July* 6, 1850, *p.* 6.

126.—CASE OF FIBRO-CYSTIC TUMOUR OF THE UTERUS, WHICH REQUIRED TAPPING; WITH REMARKS.

By Prescott Hewitt, Esq., Assistant Surgeon to St. George's Hospital.

M. G., æt. 47, single, was admitted into St. George's Hospital, under the care of Dr. Wilson, with great swelling and distension of the abdomen. The symptoms, which had existed about twelve months; had been at first confined to the left iliac fossa, but had subsequently spread over the greater part of the belly. Fluctuation was very evident in various regions, and the disease presented all the characters of ovarian dropsy. (Œdema of the legs was present, as well as pain in the region of the heart, and difficulty of breathing in going up stairs. The general health had not been much affected, but of late she had lost flesh; the catamenia had been absent for the last six months; the urine was scanty and highly acid. She was put on diuretics and good diet.

After five days it was found that she had decreased two inches in circumference round the abdomen, and that there was much less swelling of the feet. Under this plan of treatment she at first continued to improve slightly; but the symptoms and consequent distress having subsequently increased, Mr. Hawkins tapped the abdomen, and drew off fifteen pints of thick fluid of a reddish colour, and mixed, towards the last, with blood and some flakes of lymph. After the operation, it was observed that the decrease in size had occurred principally on the left side, and two masses of solid substance were detected, which appeared to form part of a tumour, rising from the pelvis. The operation was, at first, followed by marked relief; but, two days afterwards, symptoms of low peritonitis appeared, and the patient died, on the eighth day after having been tapped.

Examination of the body, eighteen hours after death.—The cavity of the peritoneum contained a large quantity of dark-coloured fluid, mixed with flakes of recently effused lymph, which served to glue together the convolutions of the intestines. In its lower two thirds, the abdomen was occupied by a large tumour, which, rising out of the pelvis, had displaced the intestines, and become attached, by slight adhesions, to the anterior wall of the belly. The upper part of this tumour was composed of large membranous-looking cysts, with thin walls, the interior of which was inflamed, and filled with a quantity of thick, dark-coloured fluid. It was one of these cysts which had been tappped during life. Towards its lower part, the tumour was principally formed of a more solid substance, and filled with an enormous number of cysts, varying from the size of a pin's head to that of a large orange. These cysts, which were all lined with a thin, smooth, delicate-looking membrane, were filled with clear fluid, containing a large quantity of albumen. The diseased mass was, at first, thought to be connected with one of the ovaries, but both these organs were found to be lying behind it, and quite healthy. On further inspection, the tumour was traced to the right side of the fundus of the uterus, to which part it was connected by means of a pedicle, two inches in breadth, and an inch and a half in length, formed by the fibres of the uterus, which were traced upwards some distance, and then lost. Among these fibres, were several vessels of a large size. Here and there, in the lower part of the tumour, were scattered some spots of fibrous tissue, hard, dense, and without any cysts. In the body of the uterus, deeply imbedded in its structure, there was a common fibrous tumour, of the size of a bean. There was no affection whatever of any of the glands. The other viscera contained in the abdomen, as well as those in the thorax, were all quite healthy.

Microscopic examination proved that the tumour was essentially of a fibrous character.

Remarks.—Accumulations of fluid, in connection with fibrous tumours of the uterus, may occur under various forms. As they present all the characters of ovarian dropsy very strongly marked, such cases are of great importance, for they have sometimes led to errors in diagnosis, and to useless operations: especially those cases in which the fluid is poured out into numerous small cysts.

The fluid is sometimes contained in a single cavity, formed by the softening and subsequent removal of the centre of the tumour, the place of which becomes filled up by serum. This, by gradually distending and thinning the outer part of the tumour, may make the disease appear as if it had been, from its origin, cyst. The quantity of fluid contained in cavities thus formed may be very great.

In other cases there are other cysts containing fluid, which are produced in a different manner. Here, the cavities lying between the fibres constituting the tumour, are generally towards its circumference, and that principally in cases where the mass, having grown more rapidly than usual, has acquired a large size. In a fibrous tumour of the uterus, weighing fifty-four pounds, which I dissected some time ago, I found several cavities, which were all situated towards its circumference. Some of these were round, others of a semilunar shape—the latter appearing to have been the original shape of the greater number of the cysts. Their formation may be thus explained. The tumour was of a pear-like shape, and composed of layers of fibres, presenting a somewhat looped appearance. The extremities of these layers, being firmly connected, formed a perfectly solid mass; whereas the centre of the loops, towards the circumference of the tumour, being but loosely connected by thin cellular tissue, had, in many places, left inter-laminar spaces, which had subsequently become filled with fluid. The cysts thus formed were of various sizes, and few in number; their cavities were perfectly smooth, and not subdivided by bands of cellular tissue.

There is another class of fibrous tumours, which appear to have been formed by the union of several smaller ones by means of loose cellular tissue, in the meshes of which fluid has been thrown out, and has subsequently formed cavities or cysts. In these cases, the cavities, generally speaking, are not of any great size, and the mass looks like a large œdematous fibrous tumour. When punctured, but little fluid escapes from them; but, if incisions be made in several places, the greater part of the fluid will drain off in a few hours, leaving a coarse, cavernous-looking tissue.

The fibro-cystic tumour described in the case of M. G., cannot, I think, be looked upon as belonging to either of the three varieties already mentioned. From its earliest formation, the tumour was most probably of a fibro-cystic nature, and exactly resembled that form of disease so commonly observed in the ovary, which is composed of unilocular cysts, of various sizes, closely aggregated together, with more or less delicate fibro-serous walls; in fact, so close was the resemblance, that for some time the mass was taken for a diseased ovary. Portions of it also closely resembled the simple cystic disease of the testis, as well as one form of fibro-cystic disease which I have met with in a large tumour of the breast. The accumulations of solid fibrous tissue observed in the case of M. G., were scattered, and small in comparison to the size of the tumour; whereas the mass of it was made up of cysts, which existed in every part, even close to the root.—*London Journal of Medicine, July,* 1850, *p.* 611.

127.—SERO-CYSTIC SARCOMA OF THE MAMMARY GLAND.

Reported by HOLMES COOTE, Esq., and revised by W. LAWRENCE, Esq., F. R. S.

[In this case, Mr. Lawrence states, a lady aged 55, of naturally pale complexion and nervous temperament, noticed, 30 years ago, a small tumour in the right breast, the size of a filbert, which remained stationary, however, causing no inconvenience, until four years ago, when it slowly increased and became occasionally painful. About the spring of the present year it had attained considerable size, the integument covering it being raised into irregular prominences, and discoloured. Then ulceration ensued, and from the opening protruded a red fungous mass, from which rather free bleeding took place on three or four occasions. Mr. Lawrence removed the tumour, which he describes as follows:—]

The right breast is enormously enlarged, the increased bulk being caused by a diseased state of the mammary gland. About one-half of the swelling at its base is covered by integument, thinned by distension, but not unhealthy nor morbidly adherent. The other half is a vast fungous protrusion, measuring about eight inches in its transverse diameter by five or six in the vertical direction. This is bounded by a raised collar, the thickness of the thumb, in which the integument and the diseased mass are completely blended. The exterior and the convexity of this elevated boundary are covered by a thin and perfectly smooth epithelium. The interior surface and the excavation which it bounds are nearly smooth and raw. Before removal it was a pinkish red, and not very sensitive; it yielded a thin yellow discharge, not offensive, but so abundant as to require change of dressing three or four times in the day. The mass, being pendulous, lay over the lower part of the chest and neighbouring portion of the abdomen, of which the integuments, constantly wetted by the discharge, were bright red and partially excoriated.

The breast, which was not painful when examined, was moveable upon the subjacent parts, and there was no glandular enlargement, nor any trace of disease in the axilla. The health was good; the patient slept well, had a fair pulse, and ate and drank with appetite.

Under these circumstances I had no hesitation in recommending the operation; for, although it might at first appear formidable to undertake the extirpation of so large a growth, yet two incisions embracing the neck of the tumour, which was overhung by the protruding mass, were sufficient for the purpose. There would be no great loss of integument, no depth of wound, nor any exposure of the axilla.

The patient having assented, the operation was performed Oct. 9. She was placed on a couch in the recumbent posture, and chloroform was administered. The breast having been drawn up and well supported, in consequence of its size and overhanging position, by a folded towel, the under incision was first made and the skin turned back: then followed the upper incision, carried along the body of the swelling, so as to form a flap nearly three inches wide, when the whole mass was readily separated by a few strokes of the knife from the loose and healthy areolar tissue which connected it to the subjacent pectoral muscle. Several arteries bled freely, but were quickly secured, so that there was no considerable loss of blood. The edges of the wound came nearly together, and the patient was put into bed. There was some bleeding in the evening caused by sickness, with vomiting; but it ceased on the application of cold, and she passed an excellent night.

The breast, which weighs 2 ℔. 6 oz., presents at its base a firm lobulated mass. I now cut into it through the middle to show you the internal structure. You see that it has undergone that morbid change called cystic sarcoma. It is a firm lobulated mass composed of various sized cysts, filled, in the specimen now before you, with a soft, friable, vascular substance of light yellowish grey colour. The cyst-walls having been distended and thinned have given away, and have allowed the protrusion of the red fungous growth which, with everted edges, occupied the front of the patient's breast. The nipple is concealed amongst the folds of integument.

The disease, which is of innocent nature, commences by enlargement of the lactiferous tubes in the substance of the gland. These become tortuous and varicose, and the naturally oily secretion which they contain is converted into a thin watery fluid. I here show you, from the museum of the hospital, the preparation of a breast which I removed some years ago from a foreign lady. It was carefully dissected by Mr. Coote, who has introduced bristles from the nipple into some lactiferous tubes, dilated to the diameter of a writing quill. In course of time portions of the tube become more or less isolated, and the cavity is gradually distended by secretion into a cyst from the walls of which may be produced a soft growth, which first filling the cyst, and then, making its way through the containing structures, emerges as a red and bleeding fungus. Upon dividing a breast so degenerated, we observe escaping from the different cysts fluids differing in consistence and colour,—in some parts thick and glutinous,—in others oily,—in others limpid and watery. The fluid may be either clear and transparent, or of various shades, from a light yellow to a deep brown tint, from admixture of blood.

As contrasted with the extirpation of a breast affected with scirrhus, the operation of removing one of these innocent tumours, which are always loosely connected to the neighbouring structures, is comparatively easy. In the present case, the diseased parts were firmly connected only in one spot, where the areolar tissue was thickened, probably from the weight of the mass. In malignant diseases, the infiltration of morbid deposit always extends beyond the structures first affected. Hence it is often necessary to make the incisions at some distance from the obvious circumference of the tumour, and to include a considerable portion of integument, the removal of which prevents the approximation of the edges of the wound, and involves the necessity of our leaving an open surface of considerable extent—a condition which adds to the patient's danger, especially when the wound is situated over a cavity containing such important organs as those of the chest.

[Mr. Lawrence remarks on the administration of chloroform in this case, that although it prevents physical suffering, obviates the severe nervous shock attending great operations, and thus leaves the patient in a much more favourable state for recovery; yet as there are some well-authenticated cases where death has resulted from it quickly, even where the dose has been small, he advises the following cautions to be observed: to administer it slowly, and to allow its dilution by the admission of the atmospheric air—to watch the pulse, and to remove the apparatus when the circulation begins to fail. At the same time he states, as an important fact, that neither in this hospital or private practice has any alarming circumstance occurred hitherto to cause him any serious apprehension.]—*Medical Times*, *Nov.* 9, 1850, *p.* 477.

128.—CASE OF SCIRRHOUS DEGENRATION OF THE MAMMARY GLAND.

By W. Lawrence, Esq., F.R.S., &c.

[The patient in this case was a nervous irritable woman, aged 45, a sufferer from rheumatism. The disease in the breast was discovered by accident, giving no uneasiness for some time; at length, occasional darting pains were experienced, extending towards the shoulder. External examination detected partial induration of the gland, extending from the nipple upwards and inwards, the rest of the organ seemed of healthy appearance. Mr. Lawrence extirpated the whole breast in the usual manner. He remarks:]

My object in directing your attention to this case is especially with reference to the question, whether in partial scirrhus of the mammary glands, we should extirpate the entire breast, or only that portion of it which we feel to be affected; and the specimen now before you is one of the many which show that the thickness of the coverings, and more especially of the subcutaneous adipose layer, not uncommonly prevents our detecting, until after the removal of the part, changes of structure, which have gone on to a considerable extent at some distance from the original seat of the disease. You here see around the first mass of scirrhous infiltration, which is about equal in size to a large walnut, four or five hard knots, which, though not detected before the operation, present, upon being cut into, those changes which we know to be characteristic of cancer; they are lobules of the mammary gland, connected to the rest of the organs by lactiferous ducts, enveloped in the same capsule, but not so closely aggregated together as in the centre of the organ. Their usually soft structure is converted into a hard semi-transparent light grey substance, in which we see lines and streaks of an opaque yellow hue, indicating the course of some of the tubules, filled with morbid secretion. Precisely the same change is seen in the indurated mass occupying the centre of the gland; the induration becoming slighter, and the alteration of colour less perceptible, as we trace the diseased part towards its circumference, where it blends with the healthy tissues.

There exist, in my opinion, sufficient grounds to lay it down as a rule, that in all cases of cancerous degeneration of the mammary gland, in which an operation is a proper measure, the entire breast should be extirpated. If a portion only be removed, we run the risk of leaving behind some part, which, though small in size, is either equally diseased, as is illustrated by the specimen, or is in a state likely to take on this morbid action, although there may be no cancerous matter absolutely deposited at the time.

In 1847, I was consulted by a lady from whom, a few weeks before I saw her, a portion of the mammary gland had been extirpated for scirrhous disease, by a very careful and well-informed surgeon in France. There is every reason to believe that the operation was performed, as far as it went, in a satisfactory manner; the edges of the wound were brought together and cicatrisation was nearly complete, when the remaining part of the breast became uneasy. Before five weeks had elapsed, from the date of the operation, the cicatrix became hard and knotty; then the wound re-opened, and the discharge, instead of being purulent, was thin and ichorous. When I saw her there was induration extending along the whole length of the cicatrix; and, towards its inner extremity, there was an irregular ulcerated surface, measuring probably an inch in its long diameter. There was no doubt whatever but that cancerous disease was recommencing in this lady's breast, and that the only measure left her was the removal of all that remained, including the cicatrix. This was done; the wound healed without any unfavourable symptom, and she now, at the expiration of nearly four years, is in the enjoyment of perfect health.

A careful examination, instituted at the time, showed that the dense fibrous structure of the cicatrix was separated and thickened by the infiltration of the nucleated cells, which were found in greatest number about the ulcerated spot, and were gradually encroaching upon the deeper structures.—*Medical Times, Nov.* 9, 1850, *p.* 478.

129.—SOME NOTES ON THE ANALOGY BETWEEN SURGICAL FEVER AND PUERPERAL FEVER.

By Dr. J. Y. Simpson, Professor of Midwifery in the University of Edinburgh.

[It is stated that nearly 3,000 mothers die in childbed, every year, in England and Wales, the great majority of which is produced by puerperal fever. Dr. Ferguson believes seven-eighths, though it is more than probable this estimate is too high. Among 2,890 women delivered at the old Endinburgh Lying-in Hospital, 47 maternal deaths occurred; out of these 36 were the consequence of puerperal fever, and the other 11 were produced by other primary obstetric complications and causes.]

[Dr. Simpson, then, passing on to the consideration of the results of surgical operations, says, that out of every 100 cases of amputation of the limbs, including amputation of the thigh, leg, arm, and forearm, about 30 terminate in death, and 70 in recovery. Among 4,937 cases of amputations, collected from the practice of some of our best civil and military surgeons, by Dr. Fenwick, 1,565 died after the operations, or nearly one in every three. In a large proportion of instances, the death of the surgical patient is the result of a combined febrile and inflammatory morbid state; which he believes to be generically, if not specifically, the same as puerperal fever in the childbed mother, and hence might be denominated "the surgical fever." A few years ago, Dr. Chevers published the apparent causes of death in 153 patients, who had died after surgical operations or injuries in Guy's Hospital. In 134 of these, the *post-mortem* examinations shewed that the more immediate cause of death was—the existence of acute inflammation of one or more internal organs or structures.]

Medical literature does not yet possess a sufficient series of data to enable us to institute a full comparison between all the elements of puerperal and of surgical fever. But the consideration of a few points may prove enough to indicate at least a strong analogy, if not an identity between these two forms of disease. With this view I shall in the following notes attempt very briefly to show in what respects puerperal and surgical fevers are assimilated to each other: 1. In the anatomical conditions and constitutional peculiarities of those who are the subjects of them; 2. In the pathological nature of the attendant fever; 3. In the morbid lesions respectively left by either disease; and, 4. In the symptoms which accompany each affection.

1. *Analogy in the anatomical, &c., conditions of the subjects of puerperal and surgical fevers.*—The anatomical conditions of the puerperal patient after delivery, and of the surgical patient after an operation, are in many respects the same. In the surgical patient we have a wound or solution of continuity on the external part of the body, made by the knife of the surgeon: this wound has, opening upon its free surface, the mouths of numerous arteries and veins; and it comes to be repaired either by the direct adhesion of its opposed surfaces, or, more slowly, by exudation of lymph and pus from its surface, and the ultimate formation of a new skin or new enveloping or connecting tissue. In the puerperal patient we have a wound or solution of continuity on the whole internal surface of the womb made by the separation of the placenta, and the exfoliation of the decidua or mucous membrane of the uterus; this wound has, opening upon its free surface, and specially at the former site of the placenta, the mouths of numerous arteries and veins; and it comes to be repaired under the usual accompanying exudation of serum, lymph, and pus (lochial discharge) from its surface, and by the ultimate formation of a new layer or coating of mucous membrane. The obstetrical patient has the wound complicated with constitutional states of the same kind as those observed in the subjects of surgical operations. Both, at the first, are liable to present the symptoms of shock or collapse, particularly if the labour or the operation has been unusually severe; both have generally a subsequent limited degree of febrile reaction—the traumatic fever of the surgeon—the so-called milk fever of the obstetrician; and the external surgical wound and the internal obstetrical wound, are liable to deviate from the standard mode of reparation; for their secretions may alter morbidly; or they may become the seat of an excess of inflammation or of ulceration; or of phlebitic suppuration and its consequences. In the internal obstetrical as in the external surgical wound, immediately after their infliction, air occasionally enters by the mouths of the veins opening upon their free surface; both are occasionally, though very rarely, followed by delirium, tetanus, and other nervous complications; and, in like manner, but much more frequently, they are apt to be followed by that form of combined febrile and inflammatory action which we term surgical fever in the surgical patient, and puerperal fever in the puerperal patient. In short, the two species of wounds are of the same pathological nature, repaired by the same pathological processes, subject to the same local pathological deviations, and liable to be attended with the same pathological constitutional effects and complications.

[Two opinions were formerly held with respect to the pathological nature of puerperal fever—one class regarding it as an idiopathic or putrid fever, sui generis—another class still more earnestly maintaining it to be essentially a local inflammation upon which the fever was depending, and that the malady was treated and cured by venesection and other active antiphlogistics; but most of our best and latest pathologists reject these ideas, and,]

On the other hand, many investigations and experiments made during the last ten or twenty years upon the effects of an acquired, or artificially excited, state of vitiation or poisoning of the blood, have inclined them more and more to adopt the doctrine, that the real source and cause of puerperal fever is to be found in a toxæmia or morbid state of the circulating fluid. The direct injection of pus, and other morbid secretions and matters, into the blood of the lower animals by Gaspard, Cruveilhier, Castelnau, and others, have produced a series of symptoms during life, and a series of lesions on the dead body, showing a very strong analogy to those of puerperal fever. The commixture of pus with the blood in the human subject, in cases of phlebitis, &c., in which pure pus enters directly into the circulation, gives rise to a similarity both of febrile functional lesions as seen during life, and of inflammatory organic lesions as seen after death. And in the puerperal female, there exist such conditions as facilitate the infection of the general circulation, by pus and other morbid matters contained in the uterine cavity. For they may obtain easy access to the general circulation—1. Through the orifices of the utero-placental veins, that open upon the internal surface of the uterus; which are, perhaps, not always completely closed; and which have their mouths constantly in contact with the contents and secretions of the uterine cavity; 2. Through the inoculation of morbid and contagious matters upon the abraded surface of the vagina; and, 3. By any accidental inflammation commencing in the lining membrane of the maternal passages (which are distended and contused during delivery), readily passing by the law of continuity alone, through the venous orifices opening on the interior of the uterus, and thence along the lining membrane of these vessels. Under the now generally adopted view, that puerperal fever originates in a vitiated condition of the blood, we can solve more easily the problem with respect to the relation of the two elements, constituting puerperal fever—namely, first, the febrile action, and, secondly, the internal inflammations, which are present during it. For under this pathological view we see, that the fever is not itself the cause of the attendant inflammations, nor these inflammations themselves the cause of the attendant fever; but that both of them—that is, both the fever and the inflammations—are the simultaneous sequences or effects of one common cause—namely, the original vitiated or diseased condition of the general circulating fluid. And, further, the same doctrine enables us to perceive, how in one set of cases, or one epidemic of puerperal fever, the febrile effect or element may be more marked than the inflammatory; and how, in others, and these generally the most amenable to treatment, the inflammatory element or effect may be more marked and more prominent than the febrile.

These views regarding the pathology of puerperal fever, are borne out and corroborated by what we see in surgical fever and its inflammatory results among the internal viscera of the body; for no pathologist has ventured to maintain that the pleurisy or peritonitis, for instance, which we often see upon the dead bodies of patients who have died of surgical fever, is the effect or consequence of that fever: or that the fever itself is a consequence or effect of these local inflammations. All at the present day are agreed that the phenomena of the occurrence of these local internal inflammations is not explicable, and is not in any way explained by the old doctrine of sympathy or metastasis; and few now dissent from the idea that we are to look for their origin, and for the origin of the attendant fatal fever, in some diseased or vitiated condition of the blood. What this vitiated condition of the blood may specifically and actually consist of, in puerperal and surgical fevers,—whether it consists in the presence of some one or more of the elements of purulent matter alone, or whether other animal secretions than pus may be its common or occasional cause, and whether the attendant type of fever and its effects may not be fixed and regulated by differences in the diseased material which is present in the circulation, are all questions which a more advanced era of pathological research, and a more subtle chemistry and histology than has yet been brought to bear upon them, will, perhaps, yet, ultimately determine. The character and phenomena of puerperal and surgical fever and their inflammatory results, agree with those of small-pox, measles, scarlatina, rheumatism, and the other so-called "disseminated inflammations" of M. Chomel in this respect, that, whilst originating, as he believes, in different specific "infections of the liquids" or blood, they all agree with each other in several respects; as that they cannot be excited artificially by the common causes of inflammation, but are developed by specific causes; they are thus secondary inflammations resulting from a primary morbid diathesis or alteration of the animal fluids; antiphlogistic measures possess usually comparatively little influence upon the duration of these disseminated inflammations, and often but a doubtful influence upon their intensity; and, lastly, whilst the unity of each affection is preserved, each is represented by a multiplicity of local inflammatory lesions, developed simultaneously or successively, and frequently in organs and parts distant from each other.

[The tables from Chevers, Dugès, and Tonnellé afford a variety of important evidence, and specially illustrate the following points:]

1. Both diseases generally leave upon the dead body ample evidence of the occurrence before death of acute and often extensive internal inflammatory action. 2. The internal inflammatory lesions are seldom limited in the same case to one organ or texture only, but two or more different viscera or surfaces are usually observed to have been either the simultaneous or successive seats of inflammatory action, and the different parts thus attacked are sometimes very distinct and distant from each other. 3. The internal viscera or textures, which are the first and principal seats of inflammation, are often far removed from the original wound or lesion, particularly in those cases in which the wound or lesion is in the head or extremities. From the days of Valsalva and Morgagni downwards, injuries of the head have been observed to be often followed by inflammation and the effusion of pus in the liver, lungs, pleura, &c. Dupuytren, Sir Charles Bell, Guthrie, and others, have long ago remarked that after amputation of the extremities, inflammation of the lungs or pleura (parts sufficiently distant from the seat of the wound) was a very common and a very fatal sequel. Pleurisy was found so often by Velpeau after these and other operations, that he proposed to give the disease the name of "pleurisie purulente des opérés." Rokitanski, Routh, and Kiwisch describe the inflammatory lesions of the chest as very common in the puerperal fever of Vienna and Prague: and I have seen it in some cases in Edinburgh; but generally like many of these internal inflammations in puerperal and surgical fever, the phenomena of it are not very marked during life. This, like the other inflammations in these cases, is often latent in its symptoms, though the post-mortem results show how intense the morbid action had been. But, 4. In obstetric cases the uterus, uterine appendages, and peritoneum, are the most common constant seat of the accompanying internal inflammatory action, though the organs of the thorax, &c., are not unfrequently also affected. Various causes appear to lead to this special localisation of the inflammatory action and effusions in puerperal fever. All kinds of wounds of the pelvic and generative organs are particularly liable to be followed by peritonitis, when they give rise to surgical fever. In midwifery cases the uterus—the seat of the original wound—is, like the external wound in surgical cases, liable to inflame; and this morbid action readily extends, by the law of continuity of tissue, to its appendages and peritoneum.

[Speaking of the analogy in the symptoms of puerperal and surgical fever, Dr. Simpson says there is almost no disease which varies more than puerperal fever does in different cases. And the same remark, with respect to the variability of its forms, &c., holds good with regard to surgical fever. But when either disease is fully marked, the symptoms are sufficiently striking, and similar in each,—the more marked consisting of rigors, a pulse varying in strength, but always constant with regard to the fact of its rapidity; an altered, and frequently darker, or almost icteric hue of the surface; the skin sometimes hot and dry, sometimes bathed with perspiration; local pains, and functional derangements; anxiety and general prostration and adynamia; laboured or hurried respiration; and often, at last, rapid sinking, with or without delirium. Dr. Simpson concludes as follows:]

In the preceding remarks, I have not attempted to discuss fully and minutely all the various points of analogy between puerperal fever and surgical fever. My object has been principally to direct, however imperfectly, the attention of my professional brethren to the subject, under the strong hope, that the future comparative study of the disease, and of its characteristic symptoms, lesions, and causes, in the puerperal and in the surgical patient, may yet serve mutually to illustrate the pathology of this fatal affection in each class of cases; and perhaps this hereafter may lead to the discovery of more enlightened principles of prevention and of treatment, than the isolated and divided study of the same malady respectively by the obstetrician and by the surgeon, has in times past been fortunate enough to elicit. And I do believe that if any man should ever have the good fortune to detect, or suggest any simple or practicable measures, either to avert and prevent, or to mitigate and cure, surgical and puerperal fever, he would, in doing so, confer one of the greatest of all possible benefits upon the advancement of surgery and midwifery, and be the means of saving numerous lives in operative and obstetric practice. The discovery of any such measure or measures, would undoubtedly form a most important era in the march of professional discovery. Nor does it seem utterly hopeless to expect the possible detection of some such measures, in the way of prevention at least, if not in the way of cure. We are the more encouraged to hope for such a result, as we already know various conditions capable of increasing on the one hand, and of decreasing on the other, the changes and the intensity of surgical and puerperal fever. The disease, for example, is confessedly more common and more severe among the population of towns, than among the population of the country; it is more frequent and more fatal among hospital patients than in private practice; and much more so in crowded wards than in those where the patients are few and provided with a full and free supply of fresh air. There are epidemic states in which puerperal and surgical fever is frightfully common: others in which it is very rare and apparently difficult to excite; some localities and towns are far more frequently the seat of it than others are; and various states of the economy seem to predispose the constitution to it, or against it. Surgical and obstetric patients suffering under internal organic diseases (particularly of the abdominal viscera), and under certain functional derangements of the kidney, and perhaps of other organs, seem specially liable to be attacked with this consecutive fever and inflammation. In addition to the common antiphlogistic precautions and measures, various special prophylactic measures have been proposed with the view of guarding patients against attacks of puerperal fever, when epidemic in its character, such as large and repeated doses of quinine, chlorate of potash, &c., before or immediately after delivery. This is a line of inquiry that seems particularly to demand attention, and to deserve further careful investigation and research. Some surgeons have, with a view of rendering their operations more successful, subjected their patients to previous preparations, regimen and drugging. But the exact power and propriety of these and other measures have by no means yet been precisely fixed and ascertained. Of the propriety and efficacy of one class of prophylactic measures against puerperal fever, few practitioners in this country have any doubt. I allude to those measures which are calculated to prevent the medical practitioner or the nurse being the unhappy medium of carrying the contagion of the disease from one puerperal patient to another. This is not a fit opportunity to enter into such a long question as that relative to the occasional contagion of puerperal fever; nor to enquire under what different circumstances and conditions it may prove capable of being communicated, as whether it ever originates from the mere inhalation of contagious effluvia, brought near to the puerperal patient, &c. I shall content myself with observing here (what I have taught elsewhere for the last ten years,) that there exists, I believe, on record, a series of facts amply sufficient to prove this at least, that patients during labour have been and may be locally inoculated with a materies morbi capable of exciting puerperal fever; that this materies morbi is liable to be inoculated into the dilated and abraded lining membrane of the maternal passages during delivery, by the fingers of the attendant; that thus in transferring it from one patient to another, the fingers of the attendant act, as it were, like the ivory points formerly used by some of the early vaccinators; that the materies morbi most capable of being thus inoculated and generating the disease in a new individual seems to be the inflammatory products effected upon the serous or mucous surfaces of females who are suffering under puerperal fever, or who have died of it; and lastly, that other inflammatory effusions, when in the same way transferred and inoculated into the puerperal female, appear to have sometimes the same effect, such as the effusions into tissues, that are the seat of an asthenic, erysipelatous, or gangrenous type of inflammation.

Believing as many practitioners do, in this occasional communicability of puerperal fever, it becomes, of course, their bounden duty to avoid as far as may be, the possible propagation of it in this manner, and to use every available precaution against such a sad misfortune. And the omission of these precautions has proved, I sincerely believe, the cause of many deaths in child-bed, and continues still to do so, particularly on the continent of Europe. In the large hospital at Vienna, out of 21,120 women delivered from 1840 to 1846, 2260 died; or about 1 in every 10 mothers delivered perished, chiefly from puerperal fever. Latterly this mortality has diminished so far, that in 1848, not above 1 in 74 mothers died.

This great change was effected, in consequence simply of means being adopted to prevent the contagious inoculation of the disease being carried and transferred by the medical attendants and students, from those already affected and dead of the malady, to women who were in labour. Before 1847, almost every woman delivered in the wards attended by the medical students, was examined by a number of students; and these students had been allowed immediately previously to touch and handle the bodies of women who had died of puerperal fever, and were even taught upon them the manipulations and operations of midwifery. The mortality altered and diminished immensely and immediately from the time (May 1847,) that the assistant physician, Dr. Semelweiss, prevented students from touching parts at the autopsies, and directed all of them to wash their hands in a solution of chlorine before and after every vaginal examination.

In this instance and in others which might be cited, was not the want of a due knowledge of the communicability of puerperal fever, the cause immediately leading to these numerous maternal deaths? Were these mothers not sacrificed merely to medical prejudice, in the form of a total disbelief on the part of our continental brethren, in the contagious communicability of puerperal fever? And, lastly, if puerperal fever may be occasionally communicated by inoculation to puerperal patients, may not surgical fever be occasionally communicated to surgical patients in the same way? The question is perhaps a far more momentous one than the simple past neglect of it might *a priori* lead us to infer. It would be perhaps wandering too far out of my own province if I were venturing to discuss it here. But I may state that, on inquiring into the subject, I have repeatedly heard of instances of a rapid succession of surgical fever cases and disasters in the practice of the same surgeon, while the other surgeons in the same locality had their patients recovering as usual; and I have been told of one eminent surgeon having locked up all his cutting instruments, for some weeks, under the impression that they were in some way or other infected, and unaccountably dangerous to all his patients upon whom, for a short time previously, he had occasion to employ them. A gentleman, who was formerly surgeon to a very large hospital, and also an extensive practitioner in midwifery, informs me that, during the period of his surgical superintendence of the hospital, and when consequently often touching the discharges from all kinds of wounds and breaches of surface, puerperal fever was from time to time, common in his private obstetric practice—and, at the same period, he saw many of his hospital surgical patients die with similar symptoms.

Since giving up the surgical charge of the hospital, the occurrence of puerperal fever has ceased in his private midwifery practice. A sufficient series of such cases, would so far add another proof of identity in the two forms of fever—the puerperal and surgical—by proving an identity in their origin and mode of causation.—*Monthly Journal of Med. Science, November*, 1850, *p.* 414.

130.—ANÆSTHESIA IN NATURAL PARTURITION.

By Dr. Robert Barnes.

[Dr. Barnes says the affirmative of the following question has been too hastily assumed, viz.:]

Does chloroform save the patient from pain and its shock upon the system? Those who contend for the use of presumed anæsthetic agents in parturition were at least bound to substantiate this opinion. I submit that they have signally failed to do so.

In the first place, what mean those groans, that agitation, those suppressed mutterings or open cries which all have observed in patients undergoing surgical operations in the depth of so-called anæsthetic stupor? Are they the expression of suffering, or are they not? Can it be maintained that because patients on awaking express no recollection of that suffering, there was therefore no painful impression conveyed to the sensorium? Will it be said that because perception and memory, especially functions of the waking brain, held under the thraldom of intoxication, could take no cognizance of the fact, that painful impression produced no effect upon the system? In the case of parturition, the unconscious mother is as ignorant of her delivery as of its painful accompaniments. It might as reasonably be urged on that account that the child itself had not been born. Should we be justified in flogging a drunken man acting on the anæsthetic principle, that since he might not *feel* the infliction at the time, or *remember* it afterwards, he could not be hurt? Is there no constitutional injury in this case independent of consciousness? The law of the sequence of shock on the nervous centres upon excitation of the peripheral nerves is as inevitable as the sequence of effect upon cause. I will shortly demonstrate, by some beautiful experiments of Dr. Marshall Hall, which I have had the privilege of witnessing, the mode in which chloroform acts, and some of the relations of shock to the nervous system. It has been erroneously concluded that chloroform simply narcotises the brain, or rather, induces a deep sleep, during which state there is complete unconsciousness of pain, and a consequent avoidance of the shock which pain produces on the system. It is further assumed that chloroformisation carried to the extent which is necessary to subdue pain does not affect the spinal marrow or the sympathetic system. A strict analysis of the nervous system, aided by experiment and observation will show the fallacy of these conclusions.

Before relating these experiments, I think it necessary to remove an objection sometimes urged by those whose physiological knowledge is insufficent to reach a conviction of the unity of the nervous system in the animal kingdom. It has been said that experiments performed on frogs cannot be applied to conclusions on animals higher in the scale. I beg to observe that the experiments to be cited, or analogous ones, have been repeated with similar results in kittens, dogs, and other animals. That the action of chloroform is identical throughout the animal series no one can doubt. Many will remember Professor Brande's unfortunate guinea-pig, to which chloroform was given with such care, that its speedy recovery was announced to the spectators. At the moment of this confident announcement, the poor creature was dead. The facts recorded in the tables embodied in this paper demonstrate a similar effect on the brain, spinal marrow, and ganglionic system of man, as that observed in frogs. If any doubt remain as to the perfect application of these experiments to the argument, the numerous cases of sudden death from chloroform in the human species will dispel it.

Action of Chloroform.—Experiment 1: *Preparation.*—A frog was placed under a tumbler, having a small sponge attached to its inside, on which ten drops of chloroform had been poured.—*Observations: a.* The frog at first made strong efforts to escape from its confinement; these efforts became gradually more feeble, and separated by intervals of rest. During the first three minutes, respiration was observed, although it soon gradually diminished in force. At the end of five minutes all motion had ceased; the limbs and head had dropped; there was complete muscular relaxation: the animal seemed dead; cerebral system and voluntary function affected.—*b*. On being removed from the glass, and pinched with the forceps, *no diastaltic movements* were produced; the spinal system as well as the cerebral was overpowered.—*c*. On placing a foot under the microscope, the circulation was observed to be extremely languid; the ganglionic system was also affected.—*d*. Yet the frog was not dead. It was placed in cold water, and in an hour afterwards it recovered; its recovery, however. was an unusnal circumstance. Dr. Marshall Hall who has repeated this experiment many times, has found chloroform a far more rapid and deadly poison to the frog than prussic acid.

We see, then, that the action of chloroform is not restricted to the cerebral organs; it extends to, and paralyses, the spinal cord, and even the ganglionic system. And although it is probable that it does not affect these three symptoms in all cases with equal facility, yet there is no proof that we can give chloroform with such nicety as to confine its action to the brain, that we can stop short of affecting the spinal cord or ganglionic system. On the contrary, even when given in moderate doses, it has often been found that every part of the nervous system has been affected at the same time; and numerous cases of fatal syncope taking the practitioner by surprise, have proved that the ganglionic system may be irrecoverably struck simultaneously with the brain.

Exp. 2: *Preparation*.—A frog (male). The brain was entirely removed; then the abdominal and thoracic viscera were taken away. Thus, the cerebral centre and the ganglionic system being abstracted, the spinal system alone remained of the nervous apparatus.—*Observations*: *a*. On pinching a foot, the skin being intact, vigorous diastaltic movements were produced. If these pinchings were repeated frequently, the diastaltic movements gradually diminished in vigour, and after a short time ceased; there was *exhaustion from shock*. *b*. After an interval of rest, the diastaltic movements could be again excited: there was recovery from shock and exhaustion. *c*. When the pinchings were still continued, after a time no farther diastaltic movement could be excited: there was complete exhaustion of the diastaltic function.

If any further proof be wanting to show that this exhaustion of the diastaltic function is the result of over-excitation or shock, it will be found in the fact that a second frog similarly prepared, but not subjected to such repeated excitation, will retain the activity of the diastaltic function, long after the spinal marrow of the first frog is irrecoverably dead.

Exp. 3.: *Preparation*.—As in the former case, the brain and viscera of the abdomen and thorax were removed. In addition, the skin of one foot was peeled off; thus removing the extremities of the *esodic* nerves. *Observations*: *a*. On pinching the foot from which the skin was peeled off, no motion was produced. The *commencement* of the diastaltic nervous arc was wanting. *b*. On irritating the spinal marrow with a needle, convulsive movements of all the limbs were produced. When the spinal marrow was completely broken up, no further movements could be excited even by irritating the foot on which the skin was left entire. In this case, the *centre* of the diastaltic nervous arc was wanting. A breach in any part of the diastaltic nervous arc puts an end to the manifestation of the diastaltic function.

Action of Strychnine.—I refer to the admirable Croonian Lectures of Dr. Marshall Hall, recently published in 'The Lancet,' for another experiment, which strikingly elucidates the influence of shock.

Exp. 4: *Preparation*.—The tenth part of a grain of the acetate of strychnine, dissolved in distilled water, was applied over the cutaneous surface of a frog.—*Observations*: *a*. The most extreme excitability or hypercthism was induced. The slightest stimulus caused violent tetanoid spasm. *b*. It is the result of many observations, that, "a frog so affected by strychnine *recovers*, if it be placed in a little cool water, and left *absolutely undisturbed* in a cool place! It *dies speedily*, if continually stimulated, even by the touch of a feather. Quiescence cures, whilst each excited tetanoid spasm exhausts the vital power!"

What is the irresistible lesson drawn from these remarkable experiments? That irritation of the *esodic* nerves is surely transmitted to the spinal centre where it produces its shock. If this irritation be too long repeated, the vis nervosa is surely exhausted. And, *lastly*, that exhaustion of the vital power surely results from over-excitation of the diastaltic function, (we may call it shock,) even when the brain is unaffected, as by strychnine, or when it is entirely removed, as in the second experiment. Shall narcotisation of the brain avail?

In parturition as in surgery, in physiology as in pathology, the physical shock of nervous excitation or injury cannot be escaped from. In parturition as in surgery, the emotional shock of nervous excitation or injury may be avoided. In surgery this may be an invaluable boon. Is it so in parturition? It is more than doubtful. The emotional influences, both those excited by the sensation of pain, and those independent of pain, are of immense importance in this complicated function. The voluntary power, too, is often of the highest utility. In woman, at least, the brain should be allowed to retain its integrity, to exert its beneficial controlling influence over her own conduct, as well as its salutary aid in attaining a safe delivery; and, if for nothing else, to mark, that in her, parturition is something more than a mere animal act!

We cannot escape the conclusion, that the narcotism of chloroform is replete with mischief and danger,—whether it simply arrest the function of the brain, rendering it insensible to painful impressions, and depriving the system of that emotional safeguard which opens the glottis in the acme of the expulsive effort: or whether it paralyze the peripheral nervous system, cutting off all painful and diastaltic excitations at their source.—*Lancet*, *July* 20, 1850, *p.* 82.

131.—TWO CASES OF RUPTURED PERINEUM, WITH OPERATION.

By W. Fergusson, Esq., Surgeon to King's College Hospital, &c.

[After dwelling on the difficulty of accomplishing the re-union of the parts in ruptured perineum, Mr. Fergusson says, that "it is generally allowed that in cases which do not heal up soon after delivery, the parts being kept in perfect rest it is better to wait, before attempting any surgical means, until the primary inflammation has subsided. Mr. Fergusson has chosen the interrupted suture, certain objections to them being removed by precautionary measures. The first patient, 18 years of age, had been delivered of her first child by the forceps six months previous to her admission, and ever since had been suffering from the effects of a lacerated perineum, extending from the fourchette to the margin of the anus, the fæces involuntary passing through the recto-vaginal aperture.]

After this young woman had been duly prepared for the operation, by rest and opening medicine, she was brought into the theatre, June 1st, and placed under the influence of chloroform. The patient being secured in the position for the operation of lithotomy, Mr. Fergusson began by paring the whole length of the margins of the perineal gap, from above downward, and brought them in exact apposition, by three interrupted sutures. The next step of the operation consisted in making a longitudinal incision on each side of the line of sutures, in order to take off the tension which the neighbouring parts would naturally exercise upon the sutures. These lateral wounds were filled with dry lint, cold compresses applied to the perineum, and the patient removed to her bed, with her knees kept together by a roller.

Much care was subsequently used in keeping her quiet, and regulating the action of the bowels by enemata; and about eleven days after the operation Mr. Fergusson was enabled to remove the three sutures, as pretty firm adhesion had taken place. The bowels now became regular, without the necessity of the injections which had hitherto been systematically administered, and about one month after the operation, both the perineal wound and the lateral incisions were completely healed. The further progress of the patient has been satisfactory, the rectum has regained the faculty of retaining its contents, and the poor woman is delivered from a very distressing infirmity.

The second case refers to a woman forty-two years of age, who has been married sixteen years, has had four children and one miscarriage. In her last confinement the presentation was transverse, and it would appear that, though the delivery was effected without the use of instruments, the perineum was severely lacerated. Besides the inconvenience attending this accident, she suffered likewise from a very usual consequence of it—viz., prolapse of the uterus.

When this patient was admitted under the care of Mr. Fergusson, in March, 1850, it was discovered that, besides the derangement of her generative organs, she was tormented with tape-worm, and she expressed great anxiety to be freed from the unwelcome guest. She was therefore transferred to the physician's ward, where, by the agency of the kousso, she evacuated several yards of the tænia.

When the patient had returned to the surgical ward, Mr. Fergusson began the treatment by cauterizing the walls of the vagina, whilst the uterus was in a prolapsed condition, about one inch below the os uteri. He then replaced the womb in its natural position, and directions were given for injections of warm water to be thrown up every second hour. Patient went on tolerably well for about a fortnight, when the discharge from the vagina became rather abundant, and the womb again prolapsed with each evacuation of the bowels, or even when she turned in bed. The patient now began to complain of shooting pain in the left groin, and as the uterus still continued to come down upon the slighest exertion, Mr. Fergusson resolved to delay the final operation no longer, and on the 1st of June the patient was brought into the theatre.

She was placed in the position for lithotomy, like the subject of the preceding case; and having been rendered insensible by chloroform. Mr. Fergusson pared the edges of the perineal wound, which extended from the fourchette to the anal orifice, and for a short distance through the recto-vaginal septum, and having brought them together, they were secured by three interrupted sutures, the lateral incisions were made, and the parts dressed as in the former case.

The patient was kept very quiet, her legs being kept together by a roller, and her bowels remained confined for six days after the operation. Some pain in the abdomen, numbness of the lower extremities, and difficulty in passing the motions, were for some time complained of, but the sutures came away successively, without any untoward circumstance, and eighteen days after the operation, the parts were perfectly united, except a small opening at the anterior portion of the wound. On the 27th of June, twenty-seven days after the application of the sutures, the whole perineal wound was perfectly united, so much so, that the linear cicatrix could hardly be seen; the two lateral incisions were likewise closed up; but when Mr. Fergusson examined the parts a few days afterwards, the vagina was found tinged with fæcal matter, and it was discovered that a small communication existed between that canal and the rectum. Mr. Fergusson considered that this aperture would soon close, without any need of cauterization, as for the last fortnight the escape of fæcal matter into the vagina had gradually been lessening.—*Lancet*, *July* 20, 1850, *p.* 93.

132.—AN IMPROVED METHOD OF MAKING SPONGE TENTS.

By Charles Coates, Esq., Leeds.

Allow me to suggest an improvement on Professor Simpson's method of making sponge tents for internal polypi.

Dr. Simpson's tents are made by dipping a piece of sponge in a strong solution of gum, tying and compressing it around a central wire, as the axis, into the required conical form, by a continuous layer of whipcord, drying it, removing the cord, and subsequently coating the surface of the tent with tallow or axunge and wax.

The plan I adopt is to select a piece of the best cupped sponge, of the required form and size, and, after beating and washing it well to free it from any sand or gritty particles it may contain, to squeeze it almost to dryness in a towel. A piece of tape about ten inches long is then passed through the sponge at about one-third from its base, making a shallow groove on each side from the apertures to the base for the tape to rest in, both ends of which are tied together for the withdrawal of the tent when necessary. Having fixed one end of a piece of whipcord (say two or three yards long) to some firm object, I commence winding the other end on the sponge gradually, from apex to base, as firmly as possible. The tent is then well dried before the fire, or in an oven, previous to the removal of the cord. When it is thoroughly dry, a small hole about half an inch deep should be made in the base, with a joiner's pricker or a heated wire, for the introduction by the director. The whole surface of the tent is then slightly coated by dipping it into equal parts of melted lard and beeswax.

The advantages of this plan are obvious: 1. The tents are made with much greater facility. 2. It permits of their being compressed into much smaller compass. 3. The expansion of the tents is equally gradual, and never requires the aid of "tepid water injections," the moisture of the surrounding parts being quite sufficient.

No possible good can accrue from steeping the sponge in a solution of gum, which not only renders the operation most disagreeable and uncleanly, but also prevents the close contraction by the retention of the glutinous particles in the interstices of the sponge.

[We have seen specimens of these tents of Mr. Coates, and can confidently recommend them to the profession. Dr. Simpson himself will, we are sure, be pleased to acknowledge an improvement on his own method.]

133. UTERINE NEURALGIA.

By M. VALLEIX.

[The following valuable remarks on uterine neuralgia, by M. Valleix, appeared in 'L'Union Médicale:']

M. Valleix has pointed out a class of cases in which the cervix uteri, usually insensible, becomes the seat of the most acute suffering of a neuralgic nature, and has pointed out the diagnostic distinctions between these and cases of painful inflammatory congestion of that organ.

This neuralgic form of disease is frequently met with, but is not often recognized. In all the cases which have come under M. Valleix's notice, the affection has been accompanied by pain following the course of the lumbo-abdominal nerves. He therefore regards the neuralgia of the cervix as part of the more extensive lumbo-abdominal neuralgia. This feature is of importance in reference to the diagnosis of neuralgic from other pains of the cervix uteri.

The subjects of this neuralgic affection present all the characters of sufferers from chronic uterine congestion, with which disease the former is almost always confounded. The pain is much augmented at the menstrual period producing dysmenorrhœa. The vaginal discharge which occurs in these cases is analogous to the increased secretion from the mucous membrane of the eyelids in certain affections of the trifacial nerve. They are both functional disturbances originating in disordered nervous influence.

Careful exploration is of the first importance to its detection. The neck of the uterus will be found tender to the touch, often so to a great degree, the tenderness being most acute at the sides of the cervix, while the anterior and posterior surfaces are free. The cervix is of its ordinary form and size.

On examining the abdomen and loins, a neuralgic pain will be detected in the hypogastrium a little beyond the middle line on one side, most frequently the left only. Along the course of the first pair of lumbar nerves will be discovered other points, more or less acutely painful, and more or less isolated. The painful point always corresponds with the seat of pain in the uterus.

The chief diagnostic features are, the degree and isolation of the tenderness, the intermittent character of the pain, and the occurrence of the neuralgia of the abdomen and loins.

The treatment adopted by M. Valleix has been blisters to the hypogastric region; cauterization of the cervix, and narcotic injections, with absolute rest and general treatment.—*Medical Gazette, July* 5, 1850, *p.* 43.

134.—OBSTRUCTED VAGINA, WITH RETENTION OF THE MENSTRUAL DISCHARGE.

By Professor Syme.

A. D., aged 19, was admitted on the 10th of February. It was stated that, twelve months before, she had suffered two severe attacks of hæmatemesis, and had been confined to bed for two months by the weakness so occasioned. About five months before the time of admission, she noticed a tumour in the lower part of the abdomen. It was the size of a fist, firm, and seated above the pubes, rather inclining to the left side. Since then she had complained of pain in the back and lower part of the belly, with regular monthly exacerbations of these symptoms, and at each period had observed a distinct increase in the size of the swelling.

Upon examination it was found that the orifice of the vagina was obstructed by a dense thick membrane, through which a fluctuation on the inner side could be distinctly perceived. The abdominal tumour in size, situation, and consistence, resembled the uterus about the sixth or seventh month of pregnancy, and at the left side had a projection, somewhat larger than an egg, which seemed to be composed of a firmer substance. Dr. Simpson, who had the kindness to see the patient at my desire, thought that this tumour might depend upon a fibrous growth of the uterus; but did not regard it as affording an objection to evacuation of the retained discharge, which unduly distended the organ.

On the 12th, I pushed a bistoury through the obstructing membrane, which was extremely thick and tough, and then guided the knife on my finger so as to enlarge the opening to the full extent of the vagina. Pressure being now made on the distended uterus, induced the contents to issue in the form of a semiconsistent stream of reddish brown coloured matter, to the amount of at least four pounds. When no more could be pressed out, injections of water were thrown in both then and frequently afterwards, so as to wash out the remains of the accumulation and also the discharge, which continued for several days. Under this treatment the patient quickly recovered without any unpleasant symptom. The os uteri, which at the time of the operation was felt to be dilated as it is after parturition, soon contracted; all trace of the abdominal swelling disappeared; and the patient was dismissed well on the 7th of March.

The point of interest in this case seems to be the illustration which it affords of the advantage attending a very free division of the obstructing membrane, and the use of syringing with water subsequently. In similar cases a typhoid fever of alarming degree, and even death, has resulted from punctures made with a view to evacuation; and I feel indebted to the professor of midwifery for impressing upon me the importance of preventing any of the impurities from being retained. The knife is certainly much preferable to a trocar, and should be used with such freedom as to insure complete division of the dense membrane, which effectually resists the finger, so as not to admit of being torn.—*Monthly Journal of Med. Science, August,* 1850, *p.* 147.

135.—INTESTINAL OBSTRUCTION GIVING RISE TO SYMPTOMS SIMULATING THE PAINS OF LABOUR.

By Dr. Alexander Knox, Strangford, County Down, Ireland.

[This was a case in which Dr. Knox was sent for on account of a supposed stoppage in the intestinal canal, although heated and feverish, the painful, periodical, violent expulsatory efforts closely resembled labour. The history of the case and the character of the patient prevented this conclusion being arrived at; and the symptoms with the enlarged but not tympanitic abdomen, and the feeling of solidity which it possessed, led the Doctor to form the opinion, that some solid body was impacted in the alimentary canal, inducing reflected excitement in the abdominal muscles. Accordingly, says he,]

Having oiled my hand, I introduced it as far as possible into the anus, for the purpose of exploration, when I detected some firm bodies completely plugging up the rectum, and succeeded in removing a number of them, some entire, and others broken down by the fingers and the shank of an iron spoon, in the process of extraction. They were of a spheroid form, and each about the size of a small apple, and of a deep grass-green colour, and firm tenacious consistence. Having hooked out as much of the entire mass as I could with my fingers, to the great and immediate relief of the patient, I administered a large emollient injection with Read's syringe, which was then perfectly effectual in unloading the lower bowels, although it had produced no effect when previously employed. A course of enemata and gentle aperients left the patient, within a week, perfectly restored to health. I naturally felt curious to ascertain the composition of these green balls, to which I had never seen any thing similar. I found them, by breaking one or two of them down on a clean towel, to consist entirely of green vegetable matter, firmly agglutinated with the natural mucous excretion of the intestines. When this connecting medium was removed by frequent ablution, the entire residue was found to consist of the fibres and minute fragments of a green vegetable substance, which, on further examination and inquiry, I found to be that of the early cabbage which had then come into season; and, as there were no potatoes at that time, had, together with bacon, constituted the principal part of the patient's food for several days previously. Not the slightest trace of bile was apparent in the entire mass; nor, in fact, was there anything which I could detect, besides the vegetable matter alluded to, and the mucus, which formed the cementing medium. Denman, under the appellation of *ball-stools*, described bodies similar as to form and size, but totally differing in composition, and points out the necessity of removing them by raking, as they cause extraordinary action of the intestines, and pain, periodical in its returns, and violent in a degree. In the present case, as the strongest purgatives and repeated injections had failed to give to the peristaltic action of the bowels a sufficient stimulus for their expulsion, it is manifest that if mechanical relief had not been afforded, or had been too long delayed, a dangerous and perhaps fatal attack of inflammation must have followed. The ball-stool, according to Denman, if proper and timely means are not used, sometimes proves fatal, by bringing on a sphacelation of the parts.—*London Journal of Medicine, September*, 1850, *p.* 823.

136.—THE ENTRANCE OF AIR BY THE OPEN MOUTHS OF THE UTERINE VEINS CONSIDERED AS A CAUSE OF DANGER AND DEATH AFTER PARTURITION.

By Dr. J. R. Cormack.

[After considering with attention the phenomena which follow the introduction of air into the veins, and that these phenomena vary exceedingly in character and degree, according to certain circumstances, Dr. Cormack arrives at the following conclusions. He says:]

From the preceding cases, experiments, and arguments, some important pathological facts and practical lessons clearly flow. The subject becomes simple both in theory and practice. In the three following paragraphs, an attempt is made to give the essence of the previous pages.

1. The entrance of air into the veins does not necessarily give rise to exactly the same symptoms; the intensity of the effects depending upon the degree in which the action of the right side of the heart is arrested or impeded by its over distension, and upon the degree of asphyxia induced by the impediment to the passage of the blood through the lungs.

2. The indications of treatment are threefold; *first*, to relieve the distended right auricle; *secondly*, to treat the impending or actually present

asphyxia; and *lastly*, to prolong life by every possible means, in the hope that the air may be all absorbed, and the passage of the blood through the small vessels of the lungs again be made easy.

3. In the most rapid class of cases, in which death is suddenly threatened from paralysis of the heart from over-distension, we must first strive to relieve the organ from that condition; when the phenomena are chiefly those of asphyxia from more gradually increasing obstruction in the lungs, the various means for treating asphyxia must be resorted to, and among these, in many cases, I believe the alternate use of the hot and cold douches will be found to be very valuable, especially if combined with stimulants judiciously varied and skilfully administered externally and internally. In many cases, repose, dashing cold water in the face, keeping the surface warm, and TIME may be the only means which ought to be used.

[He then proceeds to the statement of facts proving that the entrance of air by the open mouths of the uterine veins may cause dangerous symptoms, and even death; and to the history and critical examination of some of the alleged cases.]

Legallois, in 1829, when experimenting upon animals, with a view to elucidate the effects of loss of blood, and abstinence, during gestation, observed, in three different cases, that air penetrated into the vena cava inferior and uterine veins; and that this was followed by instantaneous death. He was naturally much struck with the coincidence; and properly connecting the two circumstances as cause and effect, he has asked, in the memoir which contains the experiments referred to, whether, in some of those sudden and unexpected deaths which have occurred after delivery, and in which no explanatory lesions have been found on dissection, the entrance of air into the veins has not been the cause of death? Ollivier has also suggested a similar explanation of certain cases of sudden death after parturition. In my Graduation Thesis, published at Edinburgh in 1837, in noticing these opinions of Legallois and Ollivier, I made the following remarks—"There are various circumstances which render it possible, that in some instances in which women die unexpectedly after parturition, when all seems to be going on well, death is owing to air entering the circulation by means of the open mouths of the veins communicating with the uterine sinuses. These orifices, immediately after the separation of the decidua, are very large. They have been made the subject of investigation by many modern as well as old anatomists and obstetricians; and, upon the whole, the various descriptions correspond. Burton (writing in 1751) says, that the uterine sinuses in the ninth month of gravidation are so large as to admit the end of the biggest finger; and their orifices that open into the cavity of the womb will at the same time admit the end of the little finger. (New System of Midwifery, p. 19, Ed. 1751.) ' Now, the uterus not unfrequently contracts and expands alternately with considerable energy after the expulsion of the fœtus; and it is quite reasonable to suppose, that air may sometimes be sucked into the gaping mouths of the uterine vessels, in sufficient quantity to prove fatal to a woman exhausted with the fatigues of labour."

Thirteen years have elapsed since the Thesis now quoted from was published: but, though during that period numerous systematic treatises on Obstetrics have appeared, I am not aware that in any one of them even a single line has been devoted to this subject. Being convinced that, notwithstanding this remarkable neglect, the subject is one of great practical importance, as well as of deep scientific interest, I again bring it before the notice of the profession, trusting that the meagreness of the information to be communicated may be largely supplemented by others, of ampler experience, to whom the following considerations are respectfully addressed.

Many authors refer to this sucking in of air by the uterus, without however in any way connecting it with the immediate subject of this paper; but it may be sufficient to give a single quotation from a recent work. The following passage is from Dr. Charles Meig's 'Letters to his Class, on Females and their Diseases.' "I have," says he, "often been present at the discharge of large quantities of gas from the genitalia. A woman shall be seized with her first labour-pains, and, bearing down with great violence, thrust not the child only, but the placenta also forth upon the bed; and in bearing down with the violent force of the labour-tenesmus, she pushes the very womb itself to the bottom of the pelvis, shortening the vagina in so doing, wrinkling and crushing it down to the os magnum. As soon as the tenesmus is over, the resiliency or elasticity of the tissues recovering its power, the womb rises again to a certain height within the excavation of the pelvis; but, as it is a cul-de-sac that rises, it is natural for air to follow it, and the vagina and the womb itself may thus contain air that has been drawn up within them, upon the same principle as that which makes it follow the movement of a piston in a cylinder. Then comes a new pain—an after pain; or else I may apply my hand to the hypogastrium, and make sure of a good contraction of the womb. If I compress the womb with my hand, and particularly if I push it downwards in the pelvis, I am very apt to cause a quantity of air to rush out at the ostium vaginæ, with considerable noise. This I have heard a great many times. So, in making the examination *per vaginam*, when the uterus is very low down, or when, in making use of the speculum, I push the os tincæ far away from the os magnum, air enters the passage, and follows the retreating womb. If it be left there, and the woman be seized with a fit of coughing, or if she move quickly, or change her position, the air is pressed out with the sound of the *pet-vaginal*. There is no other way to account for it that is reasonable. So, also, a woman has a heavy womb, with a large loose vagina; she lies on the couch or bed; and the uterus retreats, as La Motte says, drawing air after it; but she rises, or coughs, or turns, and the air is expelled." (p. 289.)

If it be admitted, that air is drawn in the uterus in the way described, what ground is there for supposing that it may thence pass by the uterine veins into the vena cava, and so on to the right auricle of the heart? The uterine veins, it must be remembered, are large canals, some of them with open mouths, sufficient to admit the little finger. Nature generally closes them firmly by a coagulum; but an accession of hemorrhage may dislodge this; or the coagulum may contract and fall out, and thus leave the orifices of the veins patent. This accident may occur hours, days, or in some exceptional cases, even weeks after delivery.

Of the freedom of the communication between the cavity of the womb after delivery, and the vena cava inferior, any one may be informed by the most cursory examination of the parts on the dead body of a puerperal woman. Dance says, in his essay on phlebitis, "If even a thick injection be thrown into the vena cava inferior below the emulgent veins, it is immediately poured forth in abundance into the cavity of the womb, and overflows from the vulva; thus proving, that after delivery, the large uterine veins are open in the uterine cavity, and communicate freely with the large abdominal veins.

It might, therefore, be anticipated, *a priori*, that air might get into the vena cava, and so onward to the heart of a woman recently delivered, by being sucked into the uterus by the sudden dilatation of that organ, and by thence passing into the orifices of the uterine veins. When the uterus is relaxed, these large openings are gaping, the structure of the parts effectually preventing apposition of their parietes. Unless closed by a plug of coagulum, they are (as I have satisfied myself by examination) perfectly patent. If any obstacle exist,—such as a large clot, or contraction of the circular fibres of the cervix, or of the sphincter of the os uteri, after the air has rushed into the relaxed uterus, it must, of necessity, be propelled into these openings, should the body of the uterus contract without being able to force the air through the os. I have repeatedly seen the womb, after delivery, become inflated with air; and when the organ has contracted, I have heard the air hissing through the vulva. I have, therefore, not only no difficulty in believing, but am constrained to admit, that, should any impediment be offered, in such cases, to the free exit of the air by the os uteri, it must be forced into the uterine veins, were their mouths not protected by coagula; and thence it would rapidly pass by the current of the circulation, up the vena cava into the right auricle.

But, that cases of this kind *may* occur is not all. They have occurred; though, from attention not having been sufficiently drawn to the possibility of such accidents, fewer may have been recognized than have actually occurred. At the same time, it seems probable that the accident is a very rare one.

Dr. Collins, of Dublin, Dr. Murphy, of London, and others, long in extensive practice, inform me that they have never seen such an occurrence as the death of a woman from the entrance of air into the uterine veins. Dr. Lever, however, who views the matter in a different light, has addressed to me the following letter:

[Dr. Lever commences his letter by stating that, as his notes of the cases were unfortunately lost, he is obliged to trust entirely to memory. He proceeds:]

"All the women were multiparæ; the labours had not been over-tedious; the placentæ were thrown off without assistance; and an inert state of the uterus, with hemorrhage, ensued. This viscus seemed like a softened India-rubber bottle; and the period at which the air was *supposed* to have entered it, was when the hand was withdrawn from the abdomen, after employing forcible compression. There was an accompanying noise, very similar to that heard when a caoutchouc enema bottle is squeezed, and then allowed to fill with air; in fine, I may describe it as a rushing sound. All three patients died speedily; the quantity of blood lost not being, in my opinion, sufficient to account for death. Two were examined; one in cold weather, the other in the very height of summer. The latter presented signs of commencing putrefaction. In neither was there any large quantity of blood in the uterus; but in the sinuses, uterine veins, spermatic veins, and left renal vein, there was indubitable proof of air. This, in the former case, emitted no offensive smell when liberated. All these women had been exposed to marsh malaria, and all had enlarged spleen."

Professor Simpson has communicated the following remarks, as an appendix to Dr. John Reid's *Essay on Death from the Entrance of Air into the Veins*:—

"Several years ago, I saw," says Professor Simpson, "a case of death a few hours after delivery, which first gave me the idea that death may sometimes occur from the introduction of air into the uterine veins. The patient was an inmate of the Lying-in Hospital, and was delivered of twins. Dr. Zeigler was called to see her, in consequence of some difficulty connected with the birth of the second child. Post-partum hemorrhage, with alternate contractions and relaxations of the uterus supervened; and she seemed to rally very imperfectly from the effects of the flooding. I saw her in an hour or two afterwards. She had then a very weak and rapid, almost imperceptible pulse; an extremely anxious countenance; and here and there was an evanescent scarlatinoid rash over the surface of the body. The body was opened a few hours after death, as we were anxious to know if there was air in the veins; and we were, of course, desirous not to incur the fallacy of air arising from decomposition. The abdominal contents were exposed under water. The uterine and hypogastric veins, and lower vena cava, were full of frothy blood, and the air bubbled up. The large veins of the extremities were in the same state."

Nothing is said of the condition of the heart and lungs; the only organs in which the characteristic and certain evidence of the accident having caused death is to be found. The mere presence of air is no proof that it has caused death.

Dr. Simpson has the following remarks upon the mechanism of the introduction of air in such cases. "I think we can understand it, when we remember that the interior of the uterus after delivery, especially opposite the late seat of the placenta, is studded with venous orifices; and that, if air does once become introduced into the uterine cavity, from relaxation of the walls of the organ, it will be liable to be *forced* into these orifices, and hence into the general venous circulation, provided the uterus, in again contracting, is unable to expel its contents through the os uteri."

The cases and comments of Professor Simpson are chiefly valuable as an intimation from so eminent an authority that the ideas of Legallois, as to the reality of this accident, deserve credit. The cases may or may not have been, though they probably were, examples of the accident. It must be felt that the descriptions are not absolutely convincing: for the symptoms during life are not sufficiently detailed, and the frothy blood in the uterine veins, hypogastric veins, and vena cava inferior, can with difficulty be understood, except by supposing that, notwithstanding the short time which had elapsed since death, when the body was examined, some decomposition of the blood, and evolution of gases, had commenced. In experiments upon animals, and in cases in the human subject, in which rapid death has followed the introduction of air into the veins, frothy blood has only been found in the right side of the heart and pulmonary artery: in other parts of the body, the air, if found at all, has not been intimately mixed with the blood, but has existed in distinct bubbles. This is easily understood: for it is the churning of the struggling heart, unable to propel its elastic contents along the pulmonary artery, which causes the frothing of the blood.

It would be endless to relate all the cases which might be cited as furnishing a strong probability that air had entered the uterine veins after delivery, inducing, in some instances, transient, but alarming symptoms; in others, occasioning almost mortal effects; and in others, causing, or along with uterine hemorrhage, contributing to cause sudden and unexpected death. Such cases would not furnish data of sufficient accuracy to support, far less on which to found, conclusions.

Deductions as to the prevention and treatment of accidents arising from the entrance of air by the uterine veins, after parturition.—From the facts already stated, it is plain that the treatment, both preventive and curative, is to obtain natural and permanent contraction of the uterus after delivery. As it is extremely probable that loss of blood, and the entrance of air, in many cases conjointly cause death, it is satisfactory to feel assured that the proper treatment for the one is the best also for the other, so far as the one thing primarily essential is to strive to get the uterus to contract. Plugging will also be specially proper when there is convulsive contraction and expansion of the uterus, with or without much hemorrhage; for then there exists the greatest aptitude for the atmospheric air to enter, or be forced into the uterine veins.

If a large quantity of air have entered the circulation, unequivocal evidence of this will be found by listening to the heart, when the churning sound will be heard. If death does not almost at once close the scene, the phenomena of asphyxia will set in; their rapidity and violence depending on the quantity of air which has entered, on its passing up to the heart in one large volume, or in divided quantities, on the presence or absence of hemorrhage, and on the strength of the patient. The distension of the right side of the heart, and the present or impending asphyxia, must be met by an application of the general rules given at the close of the first section of this paper, so far as they are consistent with the special circumstances of each case. In fact, there is no uniform routine practice which can be rationally recommended in this formidable class of cases. If the practitioner understand the nature of the accident, he will be able to adapt his remedial measures to the emergency. The special means adopted may infinitely vary (as in uterine hemorrhage): but the general principles of treatment are immutable, and simple, and ought to be engraven in the mind of every accoucheur. The amount of success attending their application must depend upon the promptness, nerve and sagacity of the practitioner.—*London Journal of Medicine, October*, 1850, *p.* 928.

137.—SPURIOUS PREGNANCY—ITS FREQUENCY AND NATURE.

By Dr. Simpson and Dr. Keiller.

Dr. Simpson first showed how frequent and marked the phenomena of spurious pregnancy were among domestic animals, as in the bitch, cow, &c. In these animals the phenomena of pregnancy often occurred both subsequently to unsuccessful sexual intercourse, and also frequently after seasons of heat, but during which there was no intercourse with the male. Occasionally the phenomena of pregnancy in them were suddenly interrupted, and terminated a short time after their commencement; sometimes, however, they went on increasing to the full term of pregnancy, and ended in a series of puerperal phenomena, as the presence of milk in the mammæ, &c., &c. Dr. Simpson adduced a variety of facts, showing the great frequency with which the same phenomena of spurious pregnancy occur in the human female in a more or less marked degree, and how these phenomena are often mistaken for dyspepsia, hysteria, and various anomalous and perplexing ailments. And as these phenomena sometimes occur in the virgin state among the lower animals, so do we find them also sometimes occurring in the unmarried human female, and giving rise to symptoms that have hitherto defied any nosological arrangement. Lastly, he spoke of the great use of aperients combined with tonics, and with nux vomica and galbanum in the subjugation of the phenomena of spurious pregnancy.

Spurious Pregnancy, followed by Spurious Parturition.—Dr. Keiller communicated the particulars of a case in which the symptoms of spurious pregnancy, and subsequently those of spurious parturition, existed to such a remarkable degree, as to induce the patient and her friends not only to prepare for the expected accouchement, but, when the supposed full time arrived, to believe in the actual commencement and continuance of a very painful labour, which ultimately became so protracted as to demand, according to the opinion of the attending accoucher, the immediate and unavoidable performance of the *Cæsarian section !*

Dr. K., having been requested to visit the case for the purpose of satisfying the friends of the patient as to the propriety of having recourse to such an extreme mode of accomplishing the delivery as that which had been seriously proposed to them by the individual in attendance, was astonished to find, on making an examination, without any misgivings as to the parturient condition of the patient, that all the supposed symptoms of pregnancy and of parturition had been and were still, *entirely spurious*, the uterus being evidently unimpregnated!

This startling opinion was anything but credited at the time by the females present, who altogether ridiculed the idea of the case not being one of "*real labour*," as the motions of the child had long been not only distinctly felt, but even seen "through the walls of the much distended abdomen," the patient herself insisting that the child's movements were so violent that she felt "as if it would leap through her side."

The result of the case, however, sufficiently proved that her painful attempts at delivery could not possibly have been rendered less futile by the *Cæsarian section*, or any other *obstetrical* aid, as *pregnancy never had existed !*

The patient remained for a considerable time afterwards under the immediate care of Dr. Keiller, who stated that he considered the entire group of anomalous symptoms (which she presented in a very singular degree, and which he purposes recording) in a great measure referable to hysteria.—*Monthly Journal, July,* 1150, *p.* 90.

138.—APPLICATION OF COLD AS AN ANÆSTHETIC AGENT IN OPERATIONS FOR REMOVING WARTY EXCRESCENCES.

By Thomas W. Nunn, Esq., Surgeon to the Western Dispensary.

[Mr. Nunn says, that having taken advantage of the hint given by Dr. Arnott, he has been so satisfied with the result that he considers it due to that gentleman to publish the following case. It occurred in a young married woman, who applied to the Dispensary for the purpose of being relieved of a large accumulation of warty growths about the pudenda.]

The excrescences depended from the whole of the labia minora, and surrounded the clitoris so completely, that it was difficult to distinguish the meatus urinarius. Some of them were of considerable size—as large as a common fig—others were oblong, and were attached by a narrow pedicle. A great many small ones surrounded the orifice of the vagina. She also suffered from leucorrhœal discharge. No other symptom of importance appeared. The excrescences were the cause of a great deal of suffering and inconvenience in a variety of ways.

Assisted by my friend Mr. Weston, I applied little wedge-shaped pieces of ice to the necks of the larger growths, till they became perfectly *blanched* and cold, and with a single stroke of a curved probe-pointed bistoury, removed several of the larger ones successively, without causing the patient any but slight pain.

I afterwards removed a very small growth without first applying ice. The result was, as might have been anticipated, the patient found the pain insupportable.

I found it necessary to introduce a bougie into the urethra, in order to indicate the position of the external orifice of that canal, so buried was it amongst the vegetations.

A great advantage obtained by the use of the ice, was the absence of hemorrhage; it being hardly requisite to apply a sponge during the operation. I was thereby enabled to proceed without hindrance, and a clear view was obtained of the exact extent of each sweep of the bistoury.

No reaction in the least degree excessive followed the proceeding, the progress of the case being satisfactory.

It appears to me, that by the above simple plan we may often save our patients considerable suffering, without exposing them to the least extra risk, which cannot be said of chloroform. It has been proved, on the one hand, over and over again, that if anæsthesia be not COMPLETE, there is the contingency of undesirable phenomena; while, on the other hand, if the anæsthesia be perfect, a greater chance of accident is incurred.—*Lancet, August* 31, 1850, *p.* 262.

139.—CASE OF VAGITUS UTERINUS.

By A. S. TAYLOR, Esq., Lecturer on Chemistry and Medical Jurisprudence in Guy's Hospital.

Cases of vagitus uterinus are by no means common, and many alleged instances of this kind, reported in medico-legal works, are unworthy of credit. Any authentic or well-observed case is, therefore, acceptable. The following has been communicated to me by Dr. R. Crothers, of Moy, County Tyrone. In March, 1841, he observes, I was called upon to attend Mrs. W., in labour of her sixth child; her former labours had been quick. On my arrival I found her suffering from very strong pains; and on examination the membranes were tense, and protruding through the os uteri.

The labour not progressing so rapidly as I expected, I ruptured the membranes, found the face presenting, and apparently arrested at the brim. I endeavoured to move it into a more favourable position, when happening to introduce a finger into the child's mouth, I was very much surprised to hear a *distinct cry*, which was repeated two or three times, and so loud, as to alarm the mother and attendants. The former was quite frightened, so that I had a good deal of trouble to compose her. I do not now remember if the child cried afterwards, without the fingers being introduced; but several times it did so, and so audibly, that I think the lungs must have been pretty well filled with air. I was obliged to complete the delivery by the forceps. The child is now a fine healthy boy.

Remarks.—The possibility of a child in utero, having its lungs so filled with air, as to be able to utter an audible cry, has been doubted. The above case, with a few others of a similar kind, reported in medical periodicals, removes all doubt on the subject.

In all the authentic instances that have been hitherto published, the uterine cry has been heard only where the face has presented, and the accoucheur has by any accident introduced his fingers into the mouth of the child. The air thus finds a passage to the lungs.

The only case in legal medicine on which the production of a uterine cry has any bearing, is in the application of the lung-tests in cases of infanticide. The air found in the lungs of a child may have been received into them before birth. Thus the fact that these organs floated on water, either entire, or when divided into small portions, would not furnish conclusive evidence, that the child had been born alive. It would merely prove the establishment of respiration, and not the fact of birth. These circumstances are, however, so well known to medical witnesses, that they scarcely require to be adverted to. The uterine cry has less interest, in a practical view, than vaginal respiration during the passage of the head; because in a case of unassisted labour, it is not easy to perceive how it could possibly occur: and if an accoucheur were present, then the case would not be likely to come before a medical practitioner as one of infanticide.—*Guy's Hospital Reports, Vol.* VII., *p.* 231.

140.—INDIAN HEMP AS AN OXYTOXIC.

By Dr. Simpson, Edinburgh.

Dr. Simpson stated, that, in the early part of the winter session, he had given Indian hemp (Cannabis Indica) in several cases of tedious labour, with the view of ascertaining if it possessed any oxytoxic effect (like ergot of rye) in increasing and exciting the parturient action of the uterus. He had been induced to try the effects, if any, of Indian hemp during labour, in consequence of Dr. Churchill stating, that it possessed powers similar to those of ergot of rye in arresting hemorrhage, when dependent upon congested states of the *unimpregnated* uterus. In the few cases of labour in which it was tried, parturient action seemed to be very markedly and directly increased after the exhibition of the hemp; but far more extensive and careful experiments would be required, before a difinite opinion could be arrived at relative to its possession of oxytoxic powers, and their amount.—*Monthly Journal, July* 1850, *p.* 91.

141.—THE USE OF THE BOFAREIRA,

("RICINUS COMMUNIS" OF BOTANISTS) AS A MEANS ADOPTED BY THE NATIVES OF THE CAPE DE VERD ISLANDS TO EXCITE LACTATION.

By Dr. J. O. M'William, F.R.S., R.N., &c.

While engaged in an official investigation into the nature and history of a yellow fever epidemy, prevailing in the Island of Boa Vista, in the Cape de Verds, during the year 1846, my attention was called to a remedy commonly had recourse to there, and in the other islands of the group, to accelerate and increase the flow of milk from the breasts of childbearing women, in cases where that secretion was tardy in appearing, or deficient in quantity when it did appear.

I also learnt that, on occasions of emergency, this remedy could be successfully applied to a still more important use, namely, to produce milk in the breasts of women who are not childbearing, or who even have not given birth to, or suckled a child for many years.

The leaves of a plant, called, in the language of the country, Bofareira, but which, in reality is the "Ricinus Communis" of botanists, and, occasionally, the leaves of the "Jatropha curcas," both belonging to the natural family *euphorbiaciæ*, are the means by which these interesting if not extraordinary results are produced.

The Bofareira grows in most if not all, the Cape de Verd Islands. That used by the natives for the purposes I have mentioned, is called by them the *white* bofareira, to distinguish it from what appears to be nothing more than a variety of the same species, the *red* bofareira. The *white*, or that which possesses galactagogue qualities, is recognised by the natives by the light green colour of the stem of the leaf, whilst the leaf stem of the *red* is of a purplish red hue. The latter plant is carefully avoided, as it is said to be a powerful irritant, and, if applied, as it occasionally has been, by mistake, for the *white*, it produces an immediate and often immoderate flow of the menses.

In cases of childbirth, when the appearance of the milk is delayed (a circumstance of not unfrequent occurrence in those islands) a decoction is made by boiling well a handful of the *white* Bofareira in six or eight pints of spring water. The breasts are bathed with this decoction for fifteen or twenty minutes. Part of the boiled leaves are then thinly spread over the breasts, and allowed to remain until all moisture has been removed from them by evaporation, and probably, in some measure, by absorption. This operation of fomenting with the decoction and applying the leaves, is repeated at short intervals until the milk flows upon suction by the child, which it usually does in the course of a few hours.

On occasions where milk is required to be produced in the breasts of women who have not given birth to or suckled a child for years, the mode of treatment adopted is as follows:—

Two or three handfuls of the leaves of the Ricinus are taken and treated as before. The decoction is poured, while yet boiling, into a large vessel, over which the woman sits so as to receive the vapour over her thighs and generative organs, cloths being carefully tucked around her so as to prevent the escape of the steam. In this position she remains for ten or twelve minutes, or until the decoction cooling a little, she is enabled to bathe the parts with it, which she does for fifteen or twenty minutes more. The breasts are then similarly bathed, and gently rubbed with the hands; and the leaves are afterwards applied to them in the manner already described. These several operations are repeated three times during the first day. On the second day, the woman has her breasts bathed, the leaves applied, and the rubbing repeated three or four times. On the third day, the sitting over the steam, the rubbing, and the application of the leaves to, with the fomentation of, the breasts, are again had recourse to. A child is now put to the nipple, and, in a majority of instances, it finds an abundant supply of milk.

In the event of milk not being secreted on the third day, the same treatment is continued for another day, and if then there still be want of success, the case is abandoned, as the person is supposed not to be susceptible to the influence of the Bofareira.

Women with well-developed breasts are most easily affected by the Bofareira. When the breasts are small and shrivelled, the plant then is said to act upon the uterine system, bringing on the menses, if their period be distant, or causing their immoderate flow if their advent be near.

Exposure to cold is carefully avoided by persons who are being brought under the influence of the Bofareira. They scrupulously abstain from wetting with cold water either the hands or the feet.

Maria, a dark mulatto woman, with woolly hair, thirty years of age, tall, stout, and well-formed; menstruating regularly; the mother of three children, the youngest of whom was three years old, and had been weaned when under the age of one year, was brought before me by Dr. Almeida, of Boa Vista, on the morning of the 30th of June, 1846, for the purpose of being submitted to the action of the Bofareira. She stated that when her child was weaned, every trace of milk disappeared from her breasts in the course of a few days. I could not detect any sign of pregnancy. The breasts were like those of negro women in general who have borne children, pendulous and flabby. No sign of milk was given out from them upon careful expression of the nipple.

The baths, fomentations, the application of the leaves, friction, suction, &c., were adopted in the manner and order I have already described. On the second day there was a slight oozing of serous-looking milk from the nipples, with slight increase of size in the areolar portion of the breast. On the third day the milk was increased in quantity, and less watery. On the morning of the fourth day there was evident enlargement of the lower part of mamma, and milk flowed abundantly upon the application of a child to the nipple.

The use of the Bofareira in cases of childbirth, to accelerate the flow of milk, is common, but comparatively rare as a means of procuring a wet-nurse. Some instances of the latter kind occurred, in consequence of the death of mothers with children at the breast during the progress of the Boa Vista epidemy of 1845–46, which decimated a population consisting almost wholly of blacks, with a few Europeans—Portuguese and English—and a small proportion of mixed negro and European blood.

Generally, however, this use of the Bofareira is seldom called for. Death in childbirth, or prolonged illness after parturition, sometimes requires a kind relative or charitable neighbour, who for the safety of the offspring, places herself under the influence of the Bofareira.

The son of a wealthy landed proprietor of San Nicolao (well known to my friend, Mr. George Miller, of that island) a remarkably hale and robust-looking man, was wet-nursed by a woman who gave him milk produced by the bofareira. The nurse in this instance had borne two children in early life. Her husband had died shortly after the birth of her second child; she lived in a state of virtuous widowhood, and it was *many* years after the death of her husband that she so generously submitted herself to the bofareira, and nursed the infant in question.

Consul-General Rendall, of the Cape de Verds, informs me that a lady, a native of Boa Vista, now residing at San Antonio, and the wife of one of the foreign consuls, had a daughter in 1843. "Having very little milk," says Mr. Consul Rendall, "she caused an old female servant to be prepared with the bofareira, and to act as wet-nurse, which she did in the most satisfactory manner, having plenty of good milk, although she had not had a child for ten years previously. The child is now (March, 1847) a healthy one, and well-grown. In short," continues M. Rendall, "women who use the bofareira are in two or three days in order sufficient to nurse the child of a queen.

I have not been able to ascertain, from personal observation, or from any very accurate information, what effect the bofareira has upon virgins, or upon those who, although they have not borne children, are nevertheless not virgins. As regards the latter class, however, an intelligent native midwife assured my most able and observant friend, Mr. George Miller, of San Nicolao, that the effect of the administration of the bofareira is much the same upon them as upon childbearing women.

In some cases, but rarely, the decoction of the bofareira is taken internally, with a view of assisting the action of its external application.

I regret not having been informed of the alleged difference in the action of the white and red bofareiras, while I was at the Cape de Verds, that I might have examined the latter plant upon the spot.

The seeds of each plant were, however, kindly forwarded to me by Mr. George Miller, and Sir William Hooker most readily and obligingly examined them. Sir William, in a note to me, says, "What you remark as red bofareira and as white bofareira, are both, not only of the genus 'recinus,' but also of one and the same species—viz., ricinis communis, the common palma Christi, or castor-oil plant. In our gardens, as well as abroad, the plants vary, and your two plants vary a little in the form and size of the seed, and especially in the colour, but they are one and the same species."

It is thus evident that the white and red bofareiras, if they differ at all, can only be varieties of the same species. It is known, however, that certain varieties of other plants, as thyme, mint, &c., do yield different properties, and such may be the case with the bofareiras.

I have thus stated all the facts that have come to my knowledge regarding this galactagogue of the Cape de Verds, which I consider to be well worthy of a fair trial in this country. Should its action in our more temperate regions be similar to that which it exerts within the tropics, an interesting field of inquiry will be opened, as regards its hygienic, medical, medico-legal, and other relations.

These, however, are points, the consideration of which had better be reserved until it has been determined, by experiment, how far the bofareira can be successfully introduced into the practice of this country.

Note.—Dr. Tyler Smith, to whom I showed my paper before my visit to Edinburgh, has written to inform me that he has in several cases tried the bofareira in the manner described by me; and he assures me that the effects of the plant grown in this country fully bear out the facts I have detailed respecting the use of this plant in the Cape de Verd Islands.—*Lancet, September* 7, 1850, *p.* 294.

142.—GALACTAGOGUE AND EMMENAGOGUE EFFECTS OF THE LEAVES OF THE BOFAREIRA (RICINUS COMMUNIS, OR PALMA CHRISTI.)

By Dr. Tyler Smith.

[Dr. Smith states, that being struck by the facts related in Dr. M'William's paper, and learning for the first time that the plant is no other than the ricinus communis, which grows as an annual plant in this country, he determined to ascertain by Dr. M'William's wish whether the plant when growing in our latitudes, preserves its remarkable properties of stimulating the mammary glands. Dr. Smith says:]

In directing the use of the Bofareira leaves, which I have procured from the Botanical gardens at Chelsea, Kew, and the Regent's Park, I have followed as nearly as possible the description of Dr. M'William, with the exception of the application of the steam of the decoction to the generative organs. The following are the cases in which the agent has been used under my directions.

The following case was conducted by Mr. C. Stillman, one of the house-surgeons of Queen Adelaide's Lying-in-Hospital.

Case I.—Mrs. C., twenty-four years of age, rather tall and thin, mother of two children, had weaned the last about six weeks, and had still a little milk, of a very thin serous character, left in the breasts. She commenced the use of the Bofareira, on the morning of Wednesday, August 21st, by bathing the left breast only, with a strong decoction of the leaves. The leaves themselves were afterwards applied to this breast. In the evening, she repeated the bathing; after which, she perceived, on squeezing the nipple, that her milk, which was at first thin and watery, had now become quite thick. After repeating the application on Thursday the 22d, she felt throbbing pains in the breast, accompanied by sickness and pains in the back, which she described as being like after-pains, and the areola surrounding the left nipple had become much darker than the right; the glandular follicles were also larger than in the nipple which had not been under the influence of the Bofareira. The difference between the two breasts was very marked. Having at this time no more leaves, she was unable to continue the application. On the following day, a fresh supply of the leaves was obtained, and she again bathed her left breast as before. After two applications, the *catamenia* appeared before the regular time, and the fomentations were not afterwards continued.

Case II.—Mrs. H., mother of four children, her youngest child aged one year and five months, had been weaned more than six months. During the latter months of lactation, she had little milk; the breasts were small, and the nipples contracted. Before applying the Bofareira, the breasts were carefully examined, to learn if they still contained any traces of milk. After much trial, she could squeeze from her left breast the smallest points of serum from the mouths of two or three of the galactophorous ducts, as is the case with most women who have suckled; but from the right breast not a trace of moisture could be expressed. The Bofareira was used night and morning for four days, by bathing with the decoction, and the application of the hot leaves to both breasts, in the manner described by Dr. M'William. After the second application, thick milk, like the colostrum, could be squeezed from both nipples, the breasts were considerably swollen, the glands in the axillæ were also painful, and pains extended down the arms. There were, in fact, in this case, all the symptoms present, in a minor degree, which are usually observed in the establishment of the milk after parturition. Mrs. H. had also distinct periodical pains in the back and abdomen, which she compared to after-pains. A leucorrhœal discharge was also produced. At the end of the fourth day, milk flowed so freely into a breast-pump, that there was no doubt she could have suckled a child; but at this point the application of the Bofariera was omitted, and the milk has since gradually disappeared.

Case III.—Mrs. D., a married lady, without family, hearing of the use of the Bofareira in the last case, wished it tried upon herself. As there was no possibility of injury she was supplied with some of the leaves, and proceeded to use it. The application, and the use of the decoction, produced swelling of the breasts, pain in the back, and an increase of a leucorrhœal discharge, to which she is subject; but there was no appearance of milk in the breasts. At the time of using the Bofareira, the catamenial discharge had ceased about a week.

Case IV.—M. L., a young woman, who had been delivered three weeks, but whose milk, though profuse, was so poor as to be little more than serum, used the Bofareira three times. Under its use the secretion from the breasts became markedly thicker; but the child was unfortunately attacked with diarrhœa, and it was not thought advisable to continue the use of this agent longer.

Case V.—L. M.; a young woman, mother of one child, but who had weaned her infant about a year and a half, applied the Bofareira in the form of decoction and poultices two or three times; but the pain and swelling were so considerable, that she refused to go on with it. She had a little serum in the breasts, at the time when the use of the Bofareira was commenced. The secretion speedily became milky. This patient had a leucorrhœa, which had been present, ever since the weaning; and the uterine and vaginal irritation, upon which the leucorrhœa depended, had kept up, in all probability, the serous secretion from the breasts, which is common enough in leucorrhœal cases.

Since the foregoing cases occurred, I have used the remedy in a case of scanty menstruation of a remarkable kind. Owing to exposure to marsh malaria, some years ago, the patient had scarcely a sign of coloured discharge at the usual catamenial periods. She used the infusion of the leaves of the red Bofareira at the date of her period, applying the infusion and leaves to the breasts, and the vapour to the genitals, with the effect of producing, in two days, a considerable flow of the catamenia. From the effects in this case, and in one of the cases already related, the Bofareira promises to be of considerable value as a direct emmenagogue; at all events the cases in which I have tried it, show that the plant does not lose its efficacy in this climate. I hope that, in America and other parts in which the plant is common, perennial instead of annual, extensive trials of its efficacy both as an emmenagogue and a galactagogue, will be made.—*London Journal of Medicine, Oct.* 1850, *p.* 951.

143.—A JAPANESE REMEDY FOR STERILITY.

By Dr. E. Williams.

[Dr. Williams believes there is a botanical remedy in Japan and China which exerts a specific influence upon the uterus, more particularly in cases of sterility and checked menstruation. The tree is one of the order Ternstromaceæ of Jussieu, growing to the size of the English laurel, with leaves somewhat larger than the congou tea, and the odour resembling pulegium and sabina.]

The mode of preparation is to take a quantity of the leaves, macerate them in as much rice-spirit (samshu) as will just moisten them for six hours; then express and give about a teaspoonful every hour, and two or three doses will invariably bring on the menstrual secretion, which can be maintained by a dose or two daily for any length of time.

Females in the healthy state are expected to menstruate in their eighth year in Japan and China, and should they not do so they are ineligible for betrothal; therefore recourse is had to the *key tu sing* with certain results.

To ensure its success, according to popular belief, the leaves must be gathered by a virgin the while using certain cabalistic formulæ, at the full of the moon, and during the burning of a certain number of highly perfumed jop-sticks.

When required for the purpose of obviating sterility, the tree must be in its second year, and also be gathered with certain prescribed formulæ at the wane of the moon, and equal parts of the root must be added to the preparation, which is made in the same manner as the preceding receipt.

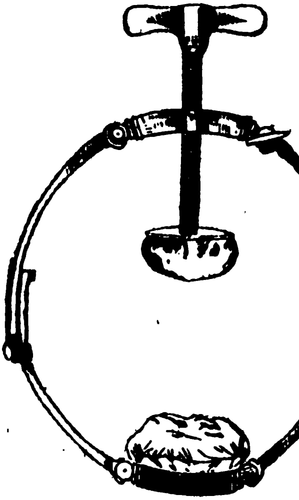
That the root is aphrodisiac in its effects I have not the slightest doubt, as I have administered it to animals with obvious results, and without any ill effects even to mules and castrati.—*Lancet, Sept.* 14, 1850, p. 321.

ADDENDA.

144.—AMPUTATION FOR CARCINOMA, AND DISEASE OF THE KNEE-JOINT.—MR. SKEY'S NEW TOURNIQUET.

Under the care of Mr. LAWRENCE.

[Mr. Lawrence used a new tourniquet in operating upon this case: an instrument invented by Mr. Skey, and manufactured by Mr. Fergusson. The following is a sketch of the same:]



It will be noticed that this tourniquet is intended to encircle the leg or thigh completely; it requires no piece of roller or bandages of any kind, and is, so far as we have seen, adapted with the greatest ease. The two elliptical halves are made of steel, about a quarter of an inch thick; they are connected above with the plate holding the screw, by two hinges, one on either side of the plate; and likewise connected with the plate which supports the cushion below, by two other hinges on either side of the latter. All stiffness is thus thoroughly avoided, and the circular figure formed by the whole instrument may be altered in various ways, and adapt itself to the shape of the limb. The hinge on the right side of the screw is provided with a peg, which, by being withdrawn, allows the branch to be completely separated from the plate, and the instrument to be opened for the purpose of applying it or taking it off. It will be perceived at one glance that the cushion below is intended for the posterior part of the limb; and when the pad attached to the screw is directed downwards, and applied to the artery, the thigh is not tightly surrounded and the return of the venous blood arrested, but the pressure on the artery is effected merely between the pad above and the cushion below. On examining the centre of the rods, it will be seen that they are composed of two equal parts, the upper receiving the lower in a ring, by which contrivance they may slide upon one another, and the instrument be rendered more or less capacious, to meet the necessities of any size. The sliding parts are provided with holes and a peg, by which the form of the tourniquet may immediately be fixed.

The preceding cut shows that the lower portion of the rod may slide upwards, and render the instrument of a smaller size. Mr. Skey applied this tourniquet himself, in the case above mentioned, and it evidently answered the purpose in a very satisfactory manner, all the surgical staff present being unanimous in the expression of their approval.—*Lancet, October* 12, 1850, *p.* 420

145.—TREATMENT OF NÆVI BY COMPRESSION, OR STRANGULATION BY A PECULIAR KNOT.—CUTANEOUS CANCER OF THE HAND; AMPUTATION.

By Mr. Fergusson.

[When Mr. Fergusson wishes to destroy these morbid growths by strangulation, he does not follow the usual method of transfixing the nævus with two pins at right angles with each other, and twisting strong silk round them, but proceeds in the following manner:]

He armed a common curved surgical needle with a strong thread, about eighteen inches long, and passed the needle (the thread being double) through the base of the tumour. One of the threads, about two inches from the eye of the needle, was then cut across, and Mr. Fergusson introduced one of the loose ends, lying on the other side of the tumour and corresponding with the cut thread, into the eye of the needle, which latter then carried two loops. (The end to be chosen is the one continuous with the thread first cut.) The needle was now carried at right angles to the direction it took at first, and when it was disengaged from the threads, the latter presented around the tumour *two loops* and *four ends*. Mr. Fergusson now pulled the threads gently, so as to ascertain their relations, and he then made two tight knots with the four loose ends. Thus the tumour was effectually strangulated, being surrounded, not only with two knots, but with four firm *loops*.

[The treatment of nævi appears to require various modifications according to the size of the growth, and the locality whence its springs. In a case where the tumour was situated on the cheek, and where it was desirable to obtain obliteration without much loss of blood, or an unsightly cicatrix, Mr. Fergusson proceeded thus:]

Two strong pins were first thrust through the base of the tumour (which was about the size of a crown piece) from below upwards, at about one inch distant from one another; and two others were passed transversely, being separated by the same space as the first. Mr. Fergusson then rolled a narrow strip of lint into the shape of a thick string, and applied it firmly round the circumference of the swelling, and under the pins. This constriction having thus steadied the tumour, a circular pledget of lint, about a quarter of an inch thick, was then placed upon the nævus, and secured in that situation by strong silk threads, which Mr. Fergusson wound round the pins, and carried across the pledget. The latter, by these means, exercised a powerful pressure upon the growth, which was expected to be sufficient to cause the complete atrophy of the latter. Nor was Mr. Fergusson deceived in his expectations. Some weeks afterwards when the needles had been withdrawn, and some ulceration which had taken place at the orifices, had cicatrized, the tumour seemed all but obliterated.

[Mr. Fergusson states that in this manner pressure of a very effectual kind may be applied to any part of the body with a great amount of certainty. He had used it in many cases for the last fifteen years, and had every reason to be satisfied with it, though it was not applicable in all instances. He in general prefers tying such tumours, but even the ligature, however well applied, sometimes fails.]—*Lancet, Oct.* 12, 1850, *p.* 421.

146.—HARE-LIP; DIRECTION GIVEN TO THE KNIFE IN THE PARING OF THE EDGES.

A few weeks ago, Mr. Fergusson had to rectify, upon a child about one year old, the deformity of hare-lip. The operation was performed in the usual manner, with the exception of the direction given to the knife whilst the margins of the fissures were being pared. As the scalpel run straight from above downwards, Mr. Fergusson made it cut slightly inwards on both sides, when he reached the red portion of the lip, so as to save a little more of that portion than of the part covered by skin. This precaution is likely to remedy a defect which is generally left after the union of parts in hare-lip. Every surgeon has noticed the peculiar notch which the red part of the lip presents after the linear wound above it has completely united; this is more or less the case with various patients, and it must have struck many practitioners that it would be very desirable to obviate this defect, and bring about the complete union of that part of the lip which is immediately continuous with the mucous membrane of the mouth. The angle inwards, with which Mr. Fergusson modified the usual rectilinear paring of the edges, is likely to effect this desideratum, and will tend to lessen very considerably the deformity left after the operation for hare-lip. Mr. Fergusson has been in the habit of modifying the incision in this manner for the last seven years, and was sorry that this method, which he believed was of French origin, was not more followed in this country. This plan was recommended by Professor Miller, of Edinburgh, and, as he (Mr. Fergusson) had learned from a recent conversation with Messrs. Smith and Teale of Leeds, was followed by some of the surgeons in that town. The child has progressed very favourably, complete union has taken place, and no notch is perceptible on the lip.—*Lancet*, *Oct*. 12, 1850, *p*. 421.

147.—TALIPES VARUS.—NEW FORM OF APPARATUS FOR EXTENSION AFTER OPERATION.

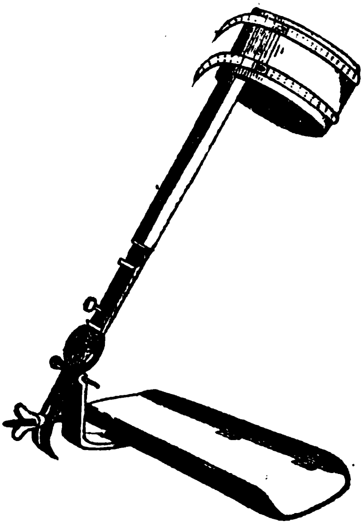
Under the care of Mr. Le Gros Clark.

[The patient was a little girl, upon whom Mr. Clark had divided the tendo achillis, to remedy congenital talipes varus.]

The patient, Mary R., aged fifteen, was admitted into St. Thomas's Hospital, under the care of Mr. Le Gros Clark, in November, 1849. The case presented an illustration of that extreme form of talipes varus, in which there was not only entire inversion of the foot, but where it was also turned over, so that the plantar region was directed upwards, whilst the dorsal surface of the tarsus rested on the ground (talipes dorsalis of some authors). A large bursal pad was developed in the latter position, and progression performed with great awkwardness and difficulty. The whole limb was shrunk, especially below the knee, and the foot shortened and curved upon itself, the toes overlapping each other. The deformity was congenital.

Shortly after the patient's admission, Mr. Clark divided the tendo-Achillis in the usual position and manner, and the foot was put up loosely in Stromeyer's apparatus. The inconvenience and imperfection of the latter became very conspicuous in this case at a very early period, for it occasioned considerable pain up the leg, and vesications on the toes, dorsal surface of the tarsus, and heel. This induced Mr. Clark, who had felt dissatisfied with all the mechanical forms of treatment which had come under his observation, to consult with the instrument-maker to the hospital, in order that an apparatus might be constructed, in itself more simple, efficacious, and easy of management, and, at the same time, less irksome to the patient. The following description of the instrument, which was immediately manufactured for, and first used in this case, was supplied by Mr. Milliken, Mr. Bigg's intelligent foreman in St. Thomas's-street, who superintended its construction.

"The instrument is intended for talipes equinus, valgus and varus, and consists of a leg-piece, with circular strap, to pass round the leg under the knee, an ankle-joint, forked extremity, and foot-piece. The joint at the ankle allows of the foot being placed at any angle, the upper part of this joint is cut in cogs, and a sliding catch is attached to the leg-piece, which fits into cogs, and secures the foot when the toe is raised. Immediately below the joint is a hinge, which allows of the foot-piece being detached at pleasure. The under part is attached to the latter, and is furnished with a nut and screw, playing in the forked extremity. The foot-piece has a ridge at each side to confine the foot, and five long holes cut in it—viz., one at the heel, and two at each side, in which the strapping is to be secured. Detach the foot-piece, and strap the foot down to it, in as straight a position as possible, and over the strapping (adhesive plaster) place a roller, leaving the portion for the hinge free. Now apply the leg-piece, and put the hinge together, letting the foot take its own position. Gently twist the affected foot with the hand, but not so as to give pain, and screw the nut so as to keep it firm. Then raise the toe of the instrument in the same way, and secure it by the latch. Examine the strapping, and snip it with a pair of scissors where it would be liable to cut. The instrument should be attended to daily."



This instrument was prepared and ready for application, on the fourth day after the operation. Before applying it, a broad and strong band of the plantar fascia was freely divided, by which the antero-posterior curvature of the foot was at once relieved, so that it could be placed flat on the foot-piece of the new apparatus.

The instrument was worn, without inconvenience to the patient, for a lengthened period; and the blisters on the toes, heel, and tarsus speedily healed. It was necessary once to intermit its use for a short time, in consequence of the patient suffering from chilblains in very cold weather. The screws were almost daily slackened from an early period, to allow of the employment of passive motion; and thus some ground was gained in effecting the requisite extension of the ankle joint.

When the apparatus was left off, a boot, with an iron support, extending up the leg, was substituted. The patient was soon able to walk, but everted the foot, whilst the knee was inverted; and though the foot was planted quite flat on the ground, it was *thrown out*, at each step, just as paralytics walk. In fact, it was evident that the extensors of the toes and flexors of the ankle were quite powerless; and no motor influence had been regained over them when she left the Hospital, early in June, though the position and shape of the foot were natural.

Mr. Le Gros Clark remarked, respecting this case, that it offered an interesting illustration of the remediability of an extreme form of distortion, by the application of a suitable apparatus after operation. But he attached much importance to the employment of daily passive motion, after the expiration of, at most, the first week; at the same time that he deprecated continuous extension, which was painful to the patient. Indeed passive motion is much more effective in procuring the same result, with infinitely less risk and suffering to the patient. He observed that it must be a subject of speculation, whether the paralyzed condition of the tibialis anticus and extensors of the toes was itself the cause of the deformity, or a consequence (from continued extension) of the retroversion of the foot. Time will prove this, as the latter defect will probably be eventually remedied, in part, if not entirely; but if this be defect of original nervous organization, it will be permanent.—*Lancet, September* 7, 1850, *p.* 303.

148.—REMARKS ON THE ADMINISTRATION OF CHLOROFORM, IN ANSWER TO PROFESSOR LIZARS.

By Dr. John Snow.

[Upon the respective merits of the inhaler and handkerchief, in the administration of chloroform, Dr. Snow remarks:]

To prove that the handkerchief, and not the use of inhalers, has been the chief cause of the deaths from chloroform, it is only necessary to enumerate the fatal cases.

1. Jan. 28, 1848. Hannah Greener, aged 15, near Newcastle. Toe-nail operation. *Handkerchief.*
2. Feb. 23, 1848. Mrs. Simmons, of Cincinnati, U. S. Extraction of teeth. *Inhaler; no medical man present.*
3. A young woman at Hyderabad, in Hindostan. Distal phalanx of a finger. *Handkerchief.*
4. May, 1848. Madlle. Stock. aged 30, at Boulogne. Opening an abscess. *Handkerchief.*
5. Dec. 1848 Young gentleman, at Govan, near Glasgow. Intended toe-nail operation. *Handkerchief.*
6. Jan. 24, 1849. J. Verrier, aged 17, Lyons. Intended amputation of finger. *Handkerchief.*
7. Feb. 20, 1849. Samuel Bennett, Westminster. Amputation of toe. *Handkerchief.*
8. Aug. 23, 1849. Mdme. Labrune, Langres, France. Intended extraction of tooth. *Handkerchief.*
9. Oct. 10, 1849. John Shorter, aged 48, St. Thomas's Hospital. Toe-nail operation. *Inhaler: given by a non-medical person.*
10. Nov. 1849. Girl Jones, Shrewsbury. Removal of eyeball. *Not stated.*
11. Young lady, Berlin. Intended extraction of tooth. *Napkin.*
12. Feb. 1850. Artilleryman, Mauritius. Amputation of last phalanx of middle finger. *Handkerchief.*
13. Alex. Scott, aged 34, Guy's Hospital. Removal of portion of hand. *Handkerchief.*

These, I believe, comprise all the recorded cases in which death was clearly due to the administration of chloroform. In one of the cases it is not stated, that a handkerchief was used, though, from the context of the report, that seemed to be the case. Of the other twelve an inhaler was used in only two of the cases, and in neither of them was it used by a medical man, whilst, in the ten instances in which death was caused by chloroform on a handkerchief, it was administered by a qualified medical man in every instance but one. There have been four cases in which death was accidentally caused by chloroform taken by the diseased parties when no one else was present. Two of these deaths occurred in Scotland. A handkerchief was used in each instance, and, but for the practice of taking chloroform on a handkerchief, these persons would probably never have taken it at all. However, I have not included these cases in the above list. There was a death commonly attributed to chloroform which I have not included in the list,—that which occurred at Mr. Robinson's, the dentist; for I believe that that was a case of fatal synocpe, due to mental emotion in a subject with fatty degeneration of the heart, and great enlargement of the liver. He was only just beginning to inhale, when he suddenly died. In that case an inhaler was employed.

Other supposed causes of the deaths from chloroform have been suggested by various writers, besides those above mentioned, only one of which I shall notice. Many persons, especially in Edinburgh, have attributed the fatal cases to the impurity of the chloroform employed; but, in the first place, it has been examined in nearly all the cases, and found to be quite good. And, again: although it might contain impurities which would cause irritation at the time, and subsequent disagreeable effects, it could not become contaminated with anything likely to cause sudden death; and, before this assertion is repeated, we ought to be told with what substance stronger than itself chloroform is liable to be contaminated. I fully admit the necessity of having chloroform, as well as other medicines, quite pure; as its adulteration, though not liable to cause death, may cause disappointment, and other disagreeable consequences; and it must also be admitted, that this as well as other drugs, is liable to impurity, both in London and elsewhere. I am of opinion, however, that impure chloroform has not been supplied by the respectable houses of this metropolis. I generally use Mr. Morson's chloroform; but have, at one time or other, used that of Mr. Squire, Mr. Jacob Bell, Mr. Bullock, Mr. Hooper, Mr. Taylor, and others, and always found it good. I have also used the chloroform of Messrs. Duncan, Flockhart & Co., of Edinburgh, and cannot give it any better praise than by saying it was equally good. If the Edinburgh people wish to assert that they can produce something better than pure chloroform they must call it by another name, for it must be a different medicine.

The real cause of the deaths from chloroform undoubtedly is, that in each case the patient has had an overdose; I mean more than was necessary to render the patient, or one of similar size and strength, insensible. By a dose of chloroform, however, must be understood, the quantity that is in the system at one time, and not the quantity inhaled during an operation. For instance, when the inhalation is left off for two or three minutes, a great part of the chloroform exhales by the breath, and the patient perhaps requires to inhale a little more. This should be considered a repetition, and not an increase of the dose.

The necessary points to be observed, in order to avoid the risk of giving an overdose, are, 1st, that its vapour be systematically diluted with a sufficient quantity of air, by means of a suitable apparatus—when no accident can happen without the continued neglect of evident warning symptoms; and, 2d, that the person administering the chloroform should keep his whole attention directed to the patient, and be able to understand all the signs that occur. I have not space here to go fully into the description of the signs which indicate when the inhalation should cease, and an operation begin, but would rather refer to some papers of mine, 'On Narcotism by Inhalation,' in the 'Medical Gazette,' 2nd vol. for 1848, and also to some papers on 'Chloroform,' by Dr. Sibson, in the same volume. I may state, however, that it is chiefly by attention to the state of the respiration and the eye, that danger is to be avoided. The pulse may be felt as a physiological inquiry, or with reference to the operation, but gives no guiding information concerning the chloroform, for the following reasons:—When the vapour is diluted to a safe extent, it might be continued till death, as I have ascertained in animals, and the pulse would still beat distinctly for many seconds after the respiration had ceased; and if, on the other hand, the vapour be of dangerous strength, the heart might suddenly cease to beat, and the first intimation of danger from the pulse would come only too late.

If chloroform be given on a handkerchief at all, not more than from fifteen to twenty *minims** should be put on at once. In this way it may be given in midwifery, as that quantity, and often much less, suffices for each application; but in surgery, where the full effect is required, this would be insufficient.—*Medical Times, Aug.* 31, *p.* 230.

149.—DANGER OF CHLOROFORM.

[The following is the opinion of Mr. Cock on the administration of chloroform, which was given at an inquest held upon Alexander Scott, who died from the effects of the drug.]

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* Drops of Chloroform are widely different from minims, being extremely small.

Mr. Cock, the operator, said, at the inquest, that in many cases where chloroform had been used, he had waited with breathless anxiety for the recovery of the patient from its influence. The public ought to know the great danger of using it, and he strongly objected to its administration under any circumstances.—*Medical Times, July* 6, 1850, *p.* 25.

150.—USE OF CHLOROFORM.

By Dr. Charles Kidd.

On referring to the case of the death by chloroform, under Mr. Cock, Dr. Kidd asks, What is the real amount of danger attending the use of this agent? He remarks :

As to its effects on the system, we do not require M. Bouisson to tell us the exact order in which the organic and vital functions become affected by chloroform ; they are evident at a glance. A more practical fact was lately stated in Paris, viz. :—that oxygen is a perfect antidote to these deadly influences,—a point worth recollecting, as bearing the semblance of truth. We have then the astounding fact stated by Gregory, of Edinburgh, that what is sold as chloroform is not chloroform at all ; some specimens he examined contained only 1-20th of the true anæsthetic principle ! The best test suggested, is agitating the chloroform with sulphuric acid, and afterwards with peroxide of manganese ; if it blackens it is impure. Specific gravity is another test : if not once-and-half heavier than water, chloroform is not pure. By keeping, I fear, chloroform does not improve ; at least it should be in well-filled and well stoppered bottles. All specimens, after a little, show unmistakeable signs of hydrochloric acid, and even free chlorine ; such are unfit for use. Pure chloroform should have little or no odour ; the latter, though so pleasant and fruity, being anything but a recommendation. We are here, then, simply between the Scylla and Charybdis of these chemical perplexities, on the one hand ; and the chances of obscure organic disease of the central parts of the nervous system, on the other,—both of which require the utmost circumspection on the part of the surgeon. The chloroform used at Guy's is as pure as any in London, and has been exhibited over and over again without ill effects, so that in the case under notice we ought perhaps to look for something wrong in the spinal and ganglionic systems.—*Medical Times, July*, 20, 1850, *p.* 63.

151.—POISONING BY STRYCHNIA; WITH REMARKS ON EXPERIMENTAL ENQUIRIES INTO ITS EFFECTS ON ANIMALS.

By George Bennett, Esq., M. R. C. S.; Sydney.

During a visit to Manilla, I tried experiments of the poisonous effects of the seeds of the *ignatia amara* (named *cabalonga* by the natives) in two instances ; one on a dog about ten months old, and with the following results :—At fifty-five minutes past ten A. M., I gave half a drachm of the seed, cut into small pieces and enveloped in a piece of meat, to a dog ; it was swallowed without any of the pieces being lost. The dog was lively and playful, but at times would appear restless and uneasy, as if some internal annoyance was occasioned by the poison. At twenty minutes past eleven he suddenly fell, with violent convulsions of the limbs, which were extended with great rigidity, and they afterwards remained in that rigid position ; this was followed by excessive panting and trembling of the muscles ; the saliva became viscid, and the tongue, as well as the saliva with which it was covered, had a dark appearance. The poison acted on the nervous system ; the dog exhibited no indication of pain ; no yell escaped him ; the eyes assumed a dull appearance ; the mouth had a movement as if the animal had been snapping at flies ; and there was a constant spasmodic twitching of the muscles of the face. At twenty-five minutes past eleven, the body became less convulsed ; the urine was passed involuntarily, but not the fæces. On passing the hand before the eyes of the animal, the eyelids were moved, indicating that consciousness had not yet departed ; the orbicularis oculi muscles had a convulsive quivering ; the snapping and panting still continued. At thirty-five minutes past eleven, a general convulsive action of the muscles came on, and terminated the existence of the animal.

An hour after death I inspected the body. On opening the thorax, the viscera had no unusual appearance. On inspecting the stomach, it was found partly filled with rice, among which the small pieces of the seeds of the *ignatia amara* were intermingled; on emptying the stomach of its contents, the inner coat was found of a pale, pinkish hue. The liver had a healthy appearance, but if any portion of that organ was cut, a quantity of blood, in a fluid state, immediately flowed: (and it is an interesting question, why we find the blood destitute of fibrin in those cases in which death proceeds from causes acting immediately on the nervous system, as where a person is struck dead by lightning, &c.?) The remainder of the abdominal and pelvic viscera had a healthy appearance. The whole of the muscles of the animal had a bloodless, blanched appearance; the vena cava and aorta were also filled with blood in a fluid state. On inspecting the brain, no particular appearance was observed, excepting that the vessels appeared totally destitute of blood.

The second experiment was on a dog, a year and a half old. At thirty-five minutes past four P. M., half a drachm of the seed, cut into small pieces, was given to the animal. At five minutes past five P. M., he suddenly fell with violent spasms of the limbs, which soon became stretched out and rigid, with spasms of the lower jaw. I was desirous of trying vinegar as an antidote; so, as soon as the spasms of the muscles of the lower jaw relaxed, I poured down some quantity; the animal appeared nearly dead. About two minutes after the vinegar had been administered, he was so much recovered as to stand up; it was, however, but of short duration, for at ten minutes past five he reeled and fell, with similar spasms as before. Another dose of vinegar was given, with the same good effects; the animal recovered, and stood up; the eyes, however, preserved throughout a dull, glairy appearance. The dog appeared uneasy, as might have been expected, and trembled exceedingly, but no expression of pain escaped from him; he seemed bewildered. At fourteen minutes past five he fell, with similar effects as before; the spasms were not, however, so severe. The same remedy was given, with the same reviving effects. The fits were accompanied at first, by violent spasmodic action of the muscles of the lower extremities, which afterwards became extended and rigid, whilst other parts of the body were convulsed. The muscles of the jaw had invariably a strong spasmodic action at the commencement of the fit, but soon became relaxed. The panting and snapping were not so marked in this as in the preceding experiment. At eighteen minutes past five he again fell; the urine was passed involuntarily, but not the fæces, and he appeared nearly dead. Vinegar was again administered; but he lay for some time without hardly an indication of existence. I thought life was extinct. At twenty-five minutes past five, the respiration, before scarcely to be perceived, became laborious, as if the circulation of the blood had again taken place, by a renewal of the heart's action; the eyes became animated, and the dog regained his sensibility; the laborious state of respiration only continued for a short period. At thirty-five minutes past five, he had not risen from his extended position on the ground, but no fit had again yet taken place. On causing him to be raised from the ground, the limbs displayed a contracted, rigid appearance, but they could be readily placed by the hand in a relaxed position. He was soon afterwards able to sit up by his own exertions; he was then so far recovered as to run the length of the cord to which he was tied, but the limbs, when he moved, appeared stiffened and paralytic. The animal, a short time previous to his being brought to me, had received an injury of the left hind leg, which had occasioned lameness: when the spasmodic action of the muscles came on, during the paroxysms the injured limb was drawn upwards and backwards, whilst the other limbs were drawn, stiffened downwards and outwards.

The animal continued apparently well, but in a miserable, debilitated state, until fifty minutes past five, when he moved about, and fell down suddenly, with the same tetanic symptoms as before; the eyes had again their dull, glairy appearance; the jaws were kept firmly closed by the violence of the spasms, which severe spasms were extended over the whole of the body; and in the space of a minute he was dead. The quantity of vinegar taken was about half a pint.

The poisonous effects of these seeds are speedy and violent. Magendie considers that its active principle—the strychnine—strongly excites the spinal marrow, without affecting, except indirectly, the functions of the brain. After the dog has taken the poison, his playful manner still continues, but mixed, at the same time, with a restlessness, which increases as the poison begins to act; he then feels inclined to lie down, then rises again, until he suddenly falls with tetanic symptoms, and during the action of the poison the animal appears bewildered.

The active principles of the *ignatia amara* are strychnine and brucine, of which the first is the more powerful, and is said to be found purer in the ignatia than in the nux vomica; but it is met with purest in the upas tienté of Java.—*Lancet*, *Aug*. 31, 1850, *p*. 259.

152.—CHLOROFORM IN A CASE OF POISONING BY STRYCHNINE.

By Dr. Munson.

Mr. G., aged about 40, of intemperate habits, took from among some medicines, on the 5th instant, a bottle of strychnine; and supposing it to be morphine, as he said, swallowed a dose supposed to be about one or two grains. In about twenty minutes afterwards Dr. Munson was requested to see him, as he was supposed to be in a "fit." He found him in the following condition:—The whole muscular system rigid; the muscles of the back, and of the upper and lower extremities, rigidly contracted; the head drawn back; articulation difficult; sense of tightness about the chest, perspiration flowing profusely from the face and chest. A number of the physicians of the place came to his assistance. The usual remedies recommended in such cases were resorted to, but without any mitigation of the urgent symptoms. The patient was failing rapidly under the increasing spasmodic action of the whole muscular system. It was now determined to administer chloroform, as death was apparently certain without some relief. One drachm of chloroform was put upon a silk handkerchief, and the patient directed to inhale it. The effect was decisive. The patient (who was at this time in a sitting posture, held so by assistants, who could not move him in the least degree without exciting the most frightful and alarming spasms) requested to be placed in a recumbent position, which was done without exciting the least spasm. The chloroform was carefully administered for some hours, the patient holding the handkerchief most of the time himself, in order, as he said, "to keep off the dreadful spasms." From this time he recovered rapidly, and on the 7th instant was able to leave for home a distance of six or seven miles.—*Boston Med. Jour.*—*Med. Gazette*, *Aug*. 2, 1850, *p*. 187.

153.—INTERESTING OBSERVATIONS ON THE SUBJECT OF VEGETABLES.

By Arthur Henfrey, Esq., F.L.S., &c., and Dr. Schleiden.

The chemical elements in vegetable bodies are of two orders; the inorganic and the organic. The inorganic are those which were formerly called ultimate principles, because their existence was shown only by ultimate analysis and destructive decomposition. These are, carbon, hydrogen, oxygen, and nitrogen, in the first place; and in smaller proportion, and less generally distributed, chlorine, iodine, bromine, sulphur, phosphorus, silicon or silicia, potassium, sodium, calcium, magnesium, aluminum, iron, manganese, copper. Of these, carbon is the most abundant, and carbon, hydrogen, and oxygen exist in all plants; while nitrogen is found only in certain orders, especially the fungi, the seeds of several of the Cerealia, the leaves of tea, and the berries of coffee.

Of the origin of these elements in plants, only one opinion is at present entertained, namely, that they are taken up from without, although some speculators, influenced probably by the love of the marvellous and the mysterious, maintained that they were in some mode formed by the organs of the plant. All these substances are either conveyed into the plant through the medium of the water surrounding it, or through that of the air.

The inorganic elements, combined in various modes and proportions, form the organic elements or proximate principles, as they used to be denominated. These are, 1. cellulose, or sklerogen; 2. amyloid; 3. vegetable jelly, or pectine; 4. starch; 5. gum; 6. sugar; 7. inulin; and 8. oil and wax.

1. Cellulose, sklerogen, or lignine, is the woody matter found in and produced by many vegetable substances. It is principally characterised by this circumstance, that, when treated with caustic potass, or concentrated sulphuric acid, starch is formed. It is abundant in the husks of seeds, the coverings of nuts, and various similar parts of plants.

3. Of vegetable jelly, bassorin, the most obvious example is salep, and, it may be added, the Irish moss or Carageen (Chondrus crispus). When dry, it is horny or cartilaginous; but when moist, it swells and assumes the appearance of jelly, more or less tremulous. It is insoluble in fixed and volatile oils, ether, and alcohol, and is not coloured by iodine. It passes, on the one side, through various transitionary states into Cellulose, through the cell walls of the *Fucoideæ*, and into amyloid; and, on the other, into starch, and in many modes into gum and sugar.

In the same manner as in animal chemistry, a distinction is made between gelatine and gelatinous substances; so Kutzing distinguishes between vegetable jelly and Gelin, the former of which, by boiling, passes into the latter. Vegetable jelly also, by long boiling, passes into *Protoplasma* or gluten. These three principles Dr. Schleiden regards as hydrated states of one common fundamental principle. He thinks it doubtful whether pectin and pectic acid ought to be placed under the head of Jelly.

4. *Starch.*—*Amylum.*—The characters of this substance are well known. Varieties are lichen starch, potatoe starch, wheat or cereal starch, arrow-root, sago, and many others. Starch is the most generally distributed principle in the vegetable kingdom; for there is scarcely a vegetable production in which starch does not form a portion more or less considerable in its growing and grown life: and in a great number of vegetable bodies it is most abundant. This extensive and copious distribution of starch is evidently connected with the uses of the vegetable world as means for furnishing food to man and animals.

Many vegetable substances,—both roots, tubers, stems, and seeds,—owe their power of furnishing food to the quantity of starch which they contain, and may be made to supply. Dr. Schleiden thinks it is no exaggeration to assert, that starch constitutes the most important and the almost exclusive food of two-thirds of the whole human race. Certain parts of plants contain it in the largest quantity, namely, the albumen of the seeds of the Cerealia, the cotyledons of the *Leguminosæ*, the medulla or pith of the stem in the *Cycadeæ* and Palms, the bulbs of the *Lilliceæ*, the tubers, root-stocks, and roots of the different families of plants. Though starch has been the subject of many researches by different inquirers, yet on few subjects are there prevalent so many opposite and conflicting opinions. It was the opinion of Poggendorf in 1836, that after ten years of investigations we are little or nothing in advance of the old views; and at present Dr. Schleiden entertains nearly the same idea.

5. *Gum* (Arabin, Dextrin, Vegetable Mucilage in part).—Its appearance and characters are well known. It is found in a state of solution in the interior of cells, or as a secretion in the large gum canals; and not unfrequently mixed with vegetable jelly, and is frequently, by means of foreign substances, coloured yellow or brown. The purest is Gum Arabic. It is found in large quantity in the *Mimosæ* and *Cycadeæ*,

Dextrin, which can be formed by the action of dilute sulphuric acid, diastase, &c., in cellulose or starch, agrees in many points with gum, and especially in elementary composition. According to Mulder, the greater part of what has hitherto been called gum is dextrin. Some time back, namely, in 1843, Dr. Schleiden advanced the opinion, that dextrin must be present in plants where so much cellulose and starch was dissolved and changed. Soon after, Mitscherlich pointed out the actual presence of dextrin in the sap of many plants. The principal difference between gum and dextrin consists in the fact, that the latter, by the action of dilute sulphuric acid or diastase, is converted into grape sugar, while the first is not. Gum, the author thinks, originates in the plant from dextrin, and is not formed as a special product of secretion; whilst dextrin is present in all the juices of the plant, and especially where cells are about to be formed, and it appears to be the formative matter of the plant. The modifications of dextrin through vegetable jelly till it forms cellulose, are almost innumerable. The transition relations of dextrin may be thus stated:—dextrin gum, vegetable jelly, cellulose.

6. *Sugar.*—This well known substance is most widely distributed through the vegetable kingdom, and especially where starch and the other substances are in the process of development, or are being dissolved; as in unripe peas, and the cereal grains; and the early sap of trees, as of the maple and beech. It is found in greater quantity and in a more permanent form in the stems of grasses, as the sugar-cane and maize, and the *Holcus saccharatus*: in fleshy roots, as the carrot, parsnip, and beet: and in juicy fruits, as the pear and apple, gooseberry and currant. Naturally it is found dissolved in the plant; but when it is excreted, it assumes the form of crystals, as in the nectaries of plants, for instance, *fritillaria imperialis*. Mannite, the sugar of manna, he regards as not belonging to this series of substances.

7. Inulin,—of which varieties are Dahlin, Calendulin, Synantherin, Sinistrin,—is obtained from the tubes of the Dahlia by simple washing. It is a powder, with fine grains; the grains clear, easily soluble in boiling water, from which it separates, on cooling, in a granular form. From the atomic proportions given by the analyses of Mulder and Crookewitt (C^{12}, H^{10}, O^{10}) as to the Inulin from the Dahlia, Helenium, and the Dandelion, it must be isomeric with sugar and starch. Inulin is found in many parts of the vegetable kingdom, where formerly starch was supposed to be contained, as in tubers and fleshy roots; for instance, *Inula Helenium*, *Dahlia variabilis*; and Dr. Schleiden thinks it probable that it is widely distributed.

8. *Fixed Oils and Wax.*—Of the latter substance, not much is accurately known. It is evidently very extensively diffused. In all those plants and parts of plants called hoary, and covered with down, the delicate bluish bloom consists of a thin layer of very minute wax granules. One of the best examples is the bloom or the down of the peach. Wax, he adds, decidedly, is formed by bees out of sugar. Is it not collected by the bees from the parts of flowers?

9. A class of substances is found in plants which neither exist in the cell walls, nor are the cell walls formed from them; yet their presence is necessary for the simplest process of vegetation. Besides the three usual principles of carbon, hydrogen, and oxygen, nitrogen is added, and sometimes phosphorus and sulphur. To these substances, which the chemists distinguish by the several names of albumen, gluten, gliadin, zymon, gelatin, diastase, vegetable gluten, legumen, &c., Dr. Schleiden applies the general denomination of Mucus (*Schleim.*) Hugo Von Mohl has named it *Protoplasma*, from its resemblance to albumen. Some of the varieties now named, Dr. Schleiden thinks, may be the result of some process of separation from the plant. According to chemical properties they have been distinguished into three groups:—vegetable albumen; fibrin, the gluten of the *Cerealia;* and Casein, which is the legumin of beans, peas, and other seeds of the *Leguminosæ*. To these Dumas adds a fourth, namely, Animal Gelatine, which, however, Schleiden thinks should be regarded as part of the composition of gluten. Mulder shows that all these substances have one common basis, which, in the same manner as in animal chemistry, he denominates *Proteine;* and he infers, that proteine, combined with sulphur, forms casein; with phosphorus and sulphur, fibrin; and with a larger proportion of sulphur, albumen. Mulder further observes, that these substances cannot be formed in the animal body, but must be introduced from without.

The principles or substances now enumerated are, during the life of the plant, incessantly passing from one to the other; and for this object the presence of mucus or albumen in the cells appears to be necessary. All are carried, suspended, or dissolved in the juices of the plant; and though some of them may co-exist at the same time in these juices, yet several of them appear to succeed each other in regular and uninterrupted series. The substance which to-day is amyloid, dextrin, and vegetable jelly, may, in the course of a few days, be sugar, starch, or gum.

Dr. Schleiden thinks that it is impossible to regard them as well-defined or distinct forms of matter, since they are thus mutually interchangeable. It is possible, also, he observes, to produce this series of bodies by mixing them with mucus, that is, vegetable albumen, or acting upon them with sulphuric acid or alkalies. or even by repeated solutions · or evaporations. But this mode of expressing himself is not accurate; and what he means, we conceive, is, that any one of these bodies may be converted into the other by the use of sulphuric acid and alkalies, or by such chemical processes as repeated solutions and evaporations. To the property which albumen, sulphuric acid, and similar agents thus possess of producing in other bodies chemical changes without themselves becoming changed, Berzelius gave the name of *Catalysis*, and Mitscherlich, that of *contact-action*.

It has been supposed that these peculiar changes depend on the operation of that principle which has been assumed to pervade living bodies, namely, the Vital. This, Dr. Schleiden is not very willing to admit, and he speaks of it as a principle or property, the existence and agency of which requires yet to be proved.

All that can be said in reference to the present subject is, that we know with certainty that, without the plant, cellulose passes into starch, that starch passes into dextrin, dextrin and cane-sugar into grape sugar, and grape sugar into gum, as in the fermentation of beet-root juice. We further know, that while the first process, that of the transition of cellulose into starch, is effected only through the agency of sulphuric acid, all the other metamorphoses can be produced without the plant, by the agency of nitrogenous substances, as albumen. It may therefore be concluded, with a considerable amount of probability, that within the bodies of plants sugar passes into dextrin, dextrin into starch, amyloid, cellulose, and vegetable jelly, that a transition takes place from wax into sugar, from sugar and starch into wax, from starch into fixed oils, and from the fixed oils into sugar and dextrin. All these changes depend chiefly on the reception or the deposition of oxygen.—*Edinburgh Med. and Surg. Journal, October*, 1850, *p.* 370.

154.—CELLULAR STRUCTURE OF PLANTS.

By Arthur Henfrey, Esq., F. L. S., &c., and Dr. Schleiden.

To those conversant with the history of botanical research and the scientific study of the structure of plants, it is well known that Robert Hooke, the earliest of English micrographers, was the first discoverer of the cellular structure of plants. He began his researches in 1619, when he received a microscope, brought to England by Cornelius Drebbel; and he appears to have beheld the cellular arrangement in 1620. After him came Marcello Malpighi, professor of anatomy at Bologna. He not only observed the celluliform structure of plants, but represented it to be composed of separate cells, to which he applied the name of *Utriculi*. Nehemiah Grew, who, during the time of Malpighi, was secretary to the Royal Society, was aware of the cellular formation; but he makes some mistakes as to the structure of their walls, which more careful observation would have enabled him to avoid.

It is singular, that though glimpses of the celluliform structure were thus early obtained, yet for a long period, nearly two centuries, it may be said, no step was taken to study the structure fully and systematically. It was only in 1833 that Robert Brown, in an interesting memoir on the *Orchideæ*, made known the existence of the cytoblast or cell-nucleus as a body frequently present in plants. He gave it the name of nucleus of the cell. In 1835 Hugo Von Mohl made known the multiplication of the vegetable cell by division in the instance of the stomata in the linæa; but this contained several imperfections, which were rectified by subsequent observation.

In 1838 Schleiden first described accurately the vegetable cell, and first pronounced its formation to be the fundamental principle in botany. By plant cells, he tells the reader, he understands exclusively the elementary organ, which, when fully developed, possesses a wall formed of cellulose and a semifluid nitrogenous content, as constituting the essential element of form in all plants, and without which the object is not a plant. These cells, for they are always multiplied, can only be formed in a fluid which contains sugar, dextrine, and albumen, (protoplasma or proteine compounds,) in short, a nitrogenous element. The proteine compounds, he thinks, are the primary agents in the process as in the chemical transformations. He specifies two circumstances as requiring to be distinguished.

The *first* is the formation of cells without the influence of another cell previously existing, as is exemplified in fluids capable of fermentation. A globule of nitrogenous substance first arises; in this a cavity is formed; it grows; and the complete cell has a delicate coat of cellulose or lignin, without our being able to determine the period at which it is produced.

The *second* circumstance is the formation of cells under the influence of a complete cell already existing, or the multiplication of the plant-cell. The mode of multiplication of vegetable cells appears not to follow the same type in all cases. He distinguishes two sorts of multiplication.

First, the *Protoplasma* or nitrogenous substance is collected into a more or less perfectly spherical body, which is at length sharply defined, and forms the nucleus of the cell, or cytoblast. Upon this is deposited a layer of protoplasm or albumen, which expands as a vesicle, and forms the subsequent lining of the cell. At a very early period the whole becomes enclosed by a wall of cellulose, and the cell is completed. This mode of multiplication appears to take place especially in the embryo sac and the embryal vesicle.

In the second mode, the whole contents of a cell, including the nitrogenous lining, are divided into two portions, which appear to be separated by a lighter zone; and around each portion is formed a wall of cellulose. The nucleus may, in this case, either be divided so as to form two *nuclei*, each of which becomes the central point for one of the cell-forming portions of the content; or it may disappear, while a new nucleus is developed in each of the new cells after their production. This second mode of multiplication appears to occur in all the other parts of the plant.

The cytoblast is met with in all newly formed cellular tissues; but at a later period it disappears from the same cells. It is seen in various stages of progress to perfection. When perfectly formed, it is a flat, lenticular, sharply defined, transparent, pale-yellow body, in which it is easy to distinguish one or two, seldom three, sharply defined and evidently hollow corpuscles, which are called *nucleoli*. In its most imperfect form, it appears merely as a flat, yellow, semigranular globule, in which are no *nucleoli*, and in which nucleoli do not subsequently appear. It varies in characters according to the plant, as well as its age; in colour, from perfect clearness to a dark yellow grey; in consistence, from granular albumen to a firm homogeneous mass; in the number of its nucleoli, from one to three; in the form of the *nucleoli*, from total absence to a hollow globule; and in its own shape, which may be globular, lenticular, or egg-shaped; and in the degree of attachment to the cell wall, from loose adhesion to perfect union with the cell wall and enclosure in a duplicature of the same.

"When the cytoblasts are perfectly formed, they soon present a delicate membrane, which encloses them, and which is sometimes extremely fine and soft, and sometimes thicker and more compact. This membrane soon becomes elevated on one surface of the cytoblast in a vesicular form, and gradually extends itself, so that the cytoblast occupies at last a small part of the wall; but still the cytoblast continues to enlarge, and the nucleoli become more evidently defined. The membrane of the vesicle, or young cell, becomes gradually stronger and thicker; it gets a round, or sometimes an elongated form, and sometimes an irregular edge, which subsequently disappears."

Another mode of cell formation has been pointed out by Naegeli, who observed it first in the primitive cells of the pollen, and subsequently found it in a large number of Algæ. This Dr. Schleiden has not himself hitherto seen; but he gives the following statement from the description of Naegeli.

"So long as a cell is internally covered with a layer of mucus, this process may go on. In the first place, this mucus layer is divided into two or four parts, each of which is surrounded by a delicate layer of mucus. These external mucus layers are converted into cellulose, and thus two or four little sacs or cells are formed, which perfectly fill up the primitive cell. In a peculiar and hitherto unexplained way, the cytoblast seems to be very active in this process. This increase takes place in most instances in cells with a central cytoblast, and this divides itself into two or four cytoblasts, each of which becomes the central point of a new cell."

No objection, Dr. Schleiden thinks, can be made to this history of cell-formation, founded on observations so careful.

To this theory, nevertheless, Mr. Henfrey urges the objection, that there is no explanation of the mode in which the albuminous sac or primordial utricle becomes divided; and the evidence of the simultaneous deposition of the septa is insufficient. This, he adds, will become apparent in the consideration of the next theory.

He then states, as a third mode of formation of new cells, that it commences by the doubling inward of the primordial utricle, so as to form an annular or ring-shaped channel. This gradually increases in depth till it divides the utricle into two portions, each a perfect closed sac. The unfolding of the primordial utricle is followed by a deposition of permanent cell-wall from each lamella.

What is the use of the nucleus, what function does it perform? is a natural question. This point, nevertheless, has not been determined. Mr. Henfrey thinks with Mohl, that it is intimately connected with the chemico-organic changes of the cell-content, and that it is concerned in the elaboration of the mucilaginous or rather plastic granular matter, which is named by Mohl, *protoplasma*.

Our limits permit not to give all the facts adduced by the authors on the process of cell-formation and the different modifications which it undergoes. But we subjoin as general inferences the following remarks:

"Up to the present time no fact has occurred which is not in accordance with the complete precedence of the cytoblast, as above observed. The indications of its precedence are only obscure and incomplete in those cases in which accurate observation is surrounded by insurmountable obstacles. It is in the formation of the spores, the foundation of the future plant, in *Cryptogamia;* in the embryo, the young plant itself, of the *Phanerogamia*, that the precedence of the cytoblast is fully made out. Both serve as points of support for analogous conclusions in other cases; and it appears, until further researches may necessitate modification, that we may safely conclude that the precedence of the cytoblast in the formation of cells is a universal fact.

"If, further, we regard the easy transformation of the assimilated matters, and may from artificially conducted experiments draw the conclusion that the nitrogenous matter which I have called mucus, and which forms the cytoblast, is the substance which calls forth these transformations; and if we further remark that sugar and dextrin are more easily soluble than jelly, and that sugar and gum are changed into jelly if the quantity of water is not increased, and which must be necessarily precipitated, we must regard the whole process of cell-formation as simply a chemical act. The gathering together of granules of mucus to form the cytoblast we can as little explain as that, when we form a solution of two salts, if we throw into the mixture a crystal of one or the other salt, that salt alone crystallizes around it."

It is well known that this celluliform structure, which is thus shown to form the basis of the vegetable tissues, Schwann has shown, is extended to animal bodies. On this extension Dr. Schleiden delivers the following commentary:—

"Schwann has pointed out, in an acute and profound treatise, that the animal organism also is composed of cells, and that these cells are formed in the same way as those of plants. If this law is found essential to some plants and animals, this analogy forms a basis for enunciating this mode of formation as a universal law for both kingdoms of nature."—*Edin. Med. and Surg. Journal, Oct.* 1850, *p.* 376.

155.—THERAPEUTICAL EMPLOYMENT OF COFFEE AND CAFEINE.

By MM. Vanden-Corput and Hannon

M. Vanden-Corput has recently published an article upon the febrifuge power of coffee, and especially its anti-neuralgic action, on which account it is now very much employed by the Belgian practitioners. Numerous therapeutical applications of this substance were made long since. Nebelius and Baglivi gave it in cephalgia, Dufour prescribed it in phthisis and migraine. Willis employed it in narcotic poisoning; and Grindel and Dorpat as a febrifuge. Musgrave, Pringle, Monin, Percival, Laennec, and a great many others, have spoken of it approvingly in essential asthma. In Dutch Batavia it is used in strong infusion, with lemon-juice, in pernicious fevers; and the practice passing thence to Holland, has led to its being preferred there to quinine. Pouqueville declares it is infallible in the intermittents of the Morea; and Martin-Solon approves of its use in the adynamic form of typhoid. Dr. Guyot has recently strongly recommended it in pertussis. Besides medicinal properties, properly so called, it possesses the important one of disguising the taste of various substances, especially quinine, sulph. magnesia, and senna; and if its antiperiodic virtues really exist, it will probably favour the action of quinine instead of impairing it, as has been feared by some. It possesses the power, too, of developing the action of *haschisch*, contradictory as this may seem to its generally acknowledged anti-narcotic properties.

With *Cafeine*, prepared according to Liebig's process, M. Vanden-Corput produces various compounds. Thus the *citrate*, which is very soluble in water, is formed by saturating pure cafeine in a solution of citric acid, and evaporating; or it may be procured by exhausting crude coffee with a very weak solution of citric acid, shaking the liquor with an equal volume of ether, decanting it, and leaving it to crystallize after concentration. Twelve grains are added to 450 grains of sugar, and the mixture given in doses of twelve grains.

The *lactate* may be prepared by dissolving cafeine in dilute lactic acid and evaporating, or by treating the infusion of green coffee with lactate of lime, filtering and evaporating. It may be given in sugar. The *malate* may be prepared in an analogous manner, and administered as a syrup by dissolving four parts of the malate in 30 of orange-flower water, and adding to it 250 of simple syrup. Cafeine may also be given with *hydrochloric acid*, as in the following formula:—Cafeine 7 grains, distilled water 1350 grains, strong hydrochloric acid 2 drops, syrup 225 grains. Dose, a table-spoonful.

M. Hannon speaks in the highest terms of the employment of the *citrate of cafeine* in *idiopathic migraine*. Ten grains are first made into as many pills, one of which is given every hour for some time before the paroxysm. The dose is gradually increased until relief is obtained; and in one case even half a drachm at a time was given. The dose must, indeed, be large, in proportion to the obstinacy of the case and the length of time between the paroxysms. Large doses are also required in old, feeble, or cachectic patients; and in old cases the medicine must be long continued. It is desirable, when possible, to commence the medicine the evening before the expected paroxysm, when the entire quantity may be divided into several doses; but if it has been delayed until the commencement of the paroxysm, the whole quantity must then be given at once. The expected paroxysm may thus be entirely arrested or merely diminished in severity; but in all cases, save where the disease is sympathetic, it eventually yields.

While upon the subject of *migraine*, we may mention a still pleasanter remedy than coffee, suggested by M. Tavignot, viz., the making several *deep inspirations* in rapid succession. We must observe, however, that M. Tavignot does not understand by the term *migraine* simple neuralgia of the head, which many writers so designate; but the condition when this is accompanied by a state of physical and moral prostration, during which the blackest ideas assail the patient,—the "blue-devils," in fact, to which the English were once thought on the continent to be especially liable. During an attack of this, which from former experience he was led to believe would continue for twenty-four hours, he was induced by the hope that this condition of the nervous centres might result from a stasis of the blood in the sinuses of the brain, or from imperfect hæmatosis, to take several deep and rapid inspirations; and after a few efforts of this kind, he found himself completely relieved, and able to resume his occupations. Other persons, similarly affected, have been in like manner relieved; but those who have tried the plan in simple neuralgia, have been disappointed. —*Bull. de Thera.—Brit. and For. Med. Chirurg. Review, Oct.*, 1850, *p.* 557.

156.—ORIGIN OF SUGAR IN THE ANIMAL ECONOMY.

Dr. Claude Bernard has just published, in the "Gazette Médicale de Paris," a very interesting paper on the origin of sugar in the animal economy. He states, that since plants can obtain from the soil and the atmosphere only, the principles of the saccharine matter, they must necessarily elaborate the latter within their organs. Is this the case with animals? inquires the author. Do they form sugar by combining its primitive elements? Or, is the sugar with them the product of the digestion of saccharine and amylaceous substances? To settle this question, the author had recourse to four different series of experiments, cleverly combined and conducted; and from these he drew the following conclusions:—1. There is constantly diabetic sugar in the blood of the heart, and in the liver of man and animals, they being in perfect health. 2. The formation of sugar takes place in the liver, and is independent of saccharine or amylaceous food. 3. The generation of sugar in the liver begins before the birth of the animal, and consequently before the direct ingestion of aliments. 4. This production of saccharine matter, which seems to be one of the functions of the liver, appears to be connected with the integrity of the pneumogastric nerves.—*Lancet, July* 13, 1850, *p.* 53.

157.—TANNIC AND GALLIC ACIDS.

By Dr. Buchner.

Tannic acid has the fault of sometimes acting too astringently, while its effects are in general limited to the points where it is applied; whether in the stomach, or at the surface of a wound, it immediately forms with the mucus, protein, &c., an insoluble compound, and does not gain access to the circulation. Part of it is, however, changed into gallic acid, which, after the continuous use of tannic acid is found in the urine.

Gallic acid more resembles, in its pharmaceutical peculiarities, catechu than tannic acid. It has an acid rather than an astringent taste. It does not coagulate protein or mucus. It is readily reabsorbed from the stomach, enters the circulation, and is found in the urine. Homburger, of Carlsruhe, employs it in doses of two or three grains in hematuria, in the bloody diarrhœa of spotted fever, and in tubercular hemoptysis, with excellent effect.—*Buchner's Rep.—Brit. and For. Med. Chir. Review, July,* 1850, *p.* 277.

158.—APPLICATION OF CHEMICAL ANALYSIS, AND MICROSCOPIC EXAMINATION OF MORBID PRODUCTS, TO THE FORMATION OF A CORRECT DIAGNOSIS.

By Bransby B. Cooper, Esq., F.R.S., &c.

[After stating the prejudice and distrust which he at first entertained towards the application of the microscope in the investigation of disease, Mr. Cooper mentions one or two interesting cases, which caused him to form a very different opinion, and which convinced him of the immense importance which the microscope may become in the formation of a sound diagnosis in many obscure cases of disease. After describing the anatomical appearance presented on a division of a scirrhous tumour, Mr. Cooper remarks:]

Dr. Hodgkin is of opinion, that scirrhus and all malignant growths, are composed of a series of simple or compound cysts contained within a general envelope. On a minute dissection of these tumours, by laying open the capsule, the cysts are found attached by a peduncle to the interior of the envelope, the body of the cyst being free, although in contact with the surrounding cysts, which sometimes are so adherent to each other as to render it difficult to distinguish their individuality. The arrangement of the malignant cysts, with respect to their outer envelope, resembles very much the relation of the tunica albuginea to the tubuli of the testicle. Dr. Hodgkin believes that the rapidity of the growth of the cysts leads to the ulceration of their common envelope, through which they protrude, and sometimes become strangulated, lose their nutrition and slough.

A cancer-cell, under ordinary circumstances, is large, rounded, granular, and dark-coloured; sometimes the cell will be found to have burst, and the granules to be diffused in the surrounding tissues. These granules seem to have the power of generating fresh growths, so that the disease goes on indefinitely increasing. When the cancer-cells are developed in the fibrous tissue of the body, they are usually smaller, more irregular in form, and appear to be comparatively limited in their growth, by the inextensibility of the tissue in which they are formed; but although slowly, the malignant growth proceeds with certainty, the fibrous tissue becomes implicated, and, perhaps, contaminated by the cancer-cells, and carcinoma fibrosum is established. The epithelium, when affected in a similar manner, undergoes a like morbid change, and epithelial cancer is, I think, a very appropriate name for the disease.

The circumstances under which abnormal effusions result, may arise from any cause, whether remote or immediately exciting, which induces disturbance in the normal condition of the blood itself, or in the vital or physical condition of the blood-vessels, or in the recipient power of the tissues. That local or constitutional deterioration may thus be produced, which is termed by pathologists inflammation, or increased action, and which is inevitably attended by an altered condition of the affected parts.

This state of inflammation may be accompanied by all the physical phenomena incident to the increased action arising from the stimulus of a new growth, or from the reparative action set up when a tissue has been subjected to injury; but still a great distinction must be drawn between this condition and that in which malignant disease becomes developed: in the former cases the natural exciting causes merely produce an increased flow of healthy blood through normally distended vessels to a tissue requiring an additional supply of nutrient matter, either for the new growth, or for the reparation of a normal structure; while, in the latter, the deteriorated condition in the force of nutrition leads to the effusion of products which may themselves become permanent morbid elements within the tissues into which they are effused, and thus constitute all those circumscribed growths which are by surgeons classed under the generic term of tumour. The nature of this new growth may very generally be ascertained by the introduction of a grooved needle, which will bring away quite sufficient of the morbid matter for microscopic examination. These products may prove to be nothing more than hypertrophy of the tissue into which they are effused, and may be productive of no injury, in some cases, not even of inconvenience, as we find in exostoses, steatomata, &c.; or from their size they may interfere with the functions of the surrounding structures, and lead to the necessity of their removal. In other cases the new developments may be of such a nature as to require a constitutional effort, either to expel them by sloughing or ulcerative process, or to produce their disintegration and dissolution into their proximate elements, so that they may be removed by absorption. In some constitutions, where the malignant diathesis prevails, these new elements may have an infinite tendency to increase, and by their continued growth lead to such a depressing influence on the nervous system as to destroy life; some persons thus affected sink from the extension of this indefinite increase to some important vital organ. If the malignant disease be of the nature of scirrhus or hard cancer, it propagates itself locally by the development of cancer-cells; but if of the soft nature, as melanosis or fungus hæmatodes, it seems to be conveyed by the absorbents into the veins, and, the blood being contaminated, any part of the body may become affected, without any continuity of the original disease. Therefore, in the case of hard cancer, when extirpation is performed, the whole of the disease must be most carefully removed, or the remaining cancer-cells will be certain to develope it afresh; in the soft kind, operation can afford but a very slight prospect of permanent success.

There are many microscopists, and I may, without partiality, quote Mr. Quekett as one of the most eminent, (as is sufficiently known to the profession by his beautiful work on 'Histology,' which has just issued from the College of Surgeons, in the humble form of a volume of the catalogue of their Museum,) who are able to determine, by microscopic examination of an effusion, whether or not the product results from a malignant action: on one occasion I took some discharge which I had removed from the surface of a fungoid tumour, and without any previous knowledge of the source from whence it was derived, Mr. Quekett pronounced it to be of malignant character: in several other instances he has recognised the same indications of malignity, merely in the blood withdrawn from the veins of a malignant tumour.

Not only is much useful knowledge to be acquired from the just estimation of the products of diseased action, from the analysis of their constituents, but at the same time the inquiry should be carried further, for the purpose of discovering whether or not, in the presence of certain abnormal elements, something like a corresponding condition of constitution is not generally present, as, indeed, is already universally acknowledged to be the case in the peculiar effusions which result from a strumous diathesis, the non-plastic products resulting from the inflammation of serous membranes in broken-down constitutions, the unhealthy granulations of cachexia, and the indefinitely increasing development in malignant disease, are all circumstances the consideration of which is calculated to lead, in my opinion, to a more certain method in the administration of remedies, than could be possibly arrived at without such investigations.

These views may appear, at first, more applicable to the practice of the physician than that of the surgeon; but as the latter has every day brought before his notice the proofs of local disorders being modified and affected by the state of the constitution, it is my object to show, that the surgeon who would practise his profession scientifically, must acquire a knowledge of the peculiar condition of his patient's constitution, by the character of the effusions which result in nature's efforts at reparation. In specific diseases, as in syphilis, we find that the local influence of the poison is modified by the constitutional peculiarities of the patient, not only as to the period at which the disease is propagated (termed the period of incubation), but also as to the conditions of the sore itself; as to whether it be indurated, phagedenic, or gangrenous, I am of opinion that such conditions are not dependent upon any peculiarity in the poison itself, but upon the diathesis of the patient; and, indeed, even the uncertainty as to the period of reparation is also attributable to constitutional causes. It is these variations which render the treatment of syphilis so difficult; but it may yet come to pass that by the aid of the microscope, and perhaps by chemical tests, we may acquire a knowledge of the nature of syphiltic virus, and thus be able to learn, whatever may be the constitutional peculiarities, whether or not the patient be the subject of a specific poison. This is most important to ascertain, for if it could be positively determined, the specific antidote, mercury, must be administered to destroy the poison, while the physical conditions of the sore itself might require other constitutional and local remedies.

[Mr. Cooper concludes the subject by relating the cases in his own practice in which the application of these aids have led to an accuracy in diagnosis, which he believes could scarcely have been arrived at by any other means.]

Case.—A young lady, æt. 28, called at my house on the 20th of February, 1850, under the following circumstances:—She stated that fifteen years before she had fallen upon her nates, causing her considerable pain, especially on the right side of the part injured, and that from that period she had perceived an enlargement in the right gluteal region, which had gone on gradually increasing in size. Upon examinination, I found a tumour about the size of a child's head, tense and fluctuating, perfectly painless, even upon manipulation, and without the slightest discoloration of the skin. With a small trocar and canula I drew off about ℥xij. of perfectly limpid fluid, as clear as fresh a mountain stream; the specific gravity was 1008: by analysis it was found to contain chloride of sodium and a small quantity of phosphate of lime, properties so exactly coinciding with those of the fluid of the spinal marrow, that I was at first lead to suspect some communication between the tumour and the vertebral column; but upon more minute inquiry into all the symptoms, the perfect absence of any approach to affection of the spinal nerves convinced me that the opinion was fallacious. Upon placing the fluid under the microscope, I soon detected numerous echinococci, which cleared up the case at once, proving the tumour to depend upon the development of hydatids. I determined, therefore, not to interfere further with the tumour, having intended, before I made this discovery, to inject it; but, from my experience in cases of hydated tumours, I have found, that the constitution of the patient remains unimpaired, so long as the animalculæ are alive; and that irritative fever is excited directly they are killed, as they immediately begin to act as any other extraneous matter, and create considerable local as well as constitutional irritation. I saw the lady again in March, when I found the tumour had scarcely increased since I had drawn off the fluid, and that it had remained quite free from pain; but she told me that her face and neck had become covered by an eruption on the day I drew off the fluid, and remained nearly a week, and then disappeared.

Case 3.—On the 20th of April I was requested by Mr. Odling of Weymouth Street, to see a patient of his, a baker's wife, in Chelsea, who was the subject of perfect paralysis, which had come on a year before, after her confinement. She had also a tumour on the left side of the neck deeply seated under the trapezius muscle; she attributed its formation to a blow (which I have almost invariably found to be the exciting cause of the development of hydatids). The tumour was quite free from pain, nor had the patient ever experienced the slightest rigor. The question was mooted by Mr. Odling, whether or not the swelling might not have some connection with the paralytic condition of the patient. As the fluctuation was distinct, I recommended the evacuation of the fluid, concluding that the contents of the tumour were not purulent, from the complete absence of rigor and constitutional irritation of any kind; I drew off 250 grains of perfectly limpid fluid, which was of very low specific gravity, 1006, and contained a large quantity of chloride of sodium, some phosphate of soda, and a trace of the phosphate of lime.

I expected, from the appearance and analysis of this fluid, to find that it contained echinococci as in the last case, and therefore placed it under the microscope, but, to my great disappointment, failed in finding any. Ten days after however, the cicatrix of the opening which I had made gave way, and several large hydatids made their escape, verifying the identity of the character of the two fluids in which the hydatids were found. In the interval of time between the evacuation of the fluid and the discharge of the hydatids, the patient had suffered considerable constitutional derangement, which yielded directly they were expelled; the tumour has entirely disappeared, although the paralysis remains, but Mr Odling thinks rather less complete than before the operation.

It sometimes happens after the operation of lithotrity, or more frequently from stricture, or from a blow on the perineum, that an abscess may form in the perineum, groin, or even on the upper part of the thigh, when it becomes a matter of great importance to discover whether or not this formation of matter depends upon the extravasation of urine, or merely upon an irritation set up from either of the above causes. The question may be readily decided by evaporating a small portion of the evacuated pus to the consistence of syrup, rendering it quite cold by placing the vessel, in which it is contained, on an ice bath, then adding a few drops of pure nitric acid; and laminated crystals of the nitrate of urea are immediately formed if urine be present.

Case 4.—I have lately had a gentleman under my care, Mr. S., æt. 63, who, 30 years ago, met with an accident, by which his back was injured, an abscess formed just below the last rib, and ever since matter has continued to form and make its escape by the opening. For the last five or six years he has become much emaciated, his appetite is bad, and his bowels very irregular in their action. Lately the discharge from the abscess has been of a bright yellow colour, and since this has been the case, he has apparently lost flesh more rapidly than before. I placed some of the yellow discharge under the microscope, and it appeared to me to be composed of chyle, mixed with granular mucous corpuscles, tinged with bile. Not satisfied with my own observations, I took some of the fluid to Mr. Quekett, who said that he could not be quite certain about the presence of chyle, as the specimen had become somewhat dry, but that there was no doubt of the presence of the biliary matter; besides this, to prove that the fluid had passed from a bowel, he pointed out to me the presence of some half-digested muscular fibre. Since that period I have seen my patient in consultation with Dr. Addison, and we both detected a strong fæcal odour in the discharge from the abscess; this proved that the chronic abscess now, at any rate, communicated with the interior of an intestine.

Case 5.—A gentleman who had submitted to lithotrity, had an abscess formed in the groin, after he had experienced great pain in voiding a portion of detritus; the surgeon questioned whether or not the urethra had been lacerated by the portion of calculus, and was disposed to believe the abscess had resulted from mere irritation; I tested the pus by the method I have described, and detected urea, which was at once conclusive that the urine had escaped from the natural passage.

Case 6.—A patient at Guy's had a blow on the perineum; a few days afterwards he was seized with rigors and great pain behind the scrotum; the next day a tumour of considerable size had formed, and the patient suffered from retention of urine. I immediately laid open the perineum, and evacuated a considerable quantity of pus, which, upon analysis, gave evidence of the presence of urea; and the true nature of the case, namely, the rupture of the urethra, was subsequently further determined by the urine passing through the opening I had made. I have, however, in two or three cases of blows on the perineum, known abscesses to result, and upon analysis of the pus not found urea to be present; in each of these cases the openings I made healed without any escape of urine through the wounds. The treatment of these cases should be modified by the knowledge thus acquired, of whether the urethra were wounded or not, as, in the former case, the patient should only be allowed to pass his urine through a catheter; while, in the latter instance, the use of the catheter is not only unnecessary, but should be strenuously abstained from, as it would only tend to increase the irritation uselessly. Abscesses in the loins, which are sometimes known to result from lesion of the kidneys or ureters, might, although usually so difficult to recognise, be at once diagnosed by this method of analysis, which should never be neglected where there is any doubt about the subject.

Such chemical indications cannot, however, always be prosecuted with advantage, although they may, in a chemical point of view, promise an effectual remedy. A gentleman, whom I had lithotrised several times, was at last freed from the presence of any detectable portion of stone: and he left London, although suffering from considerable irritation in his bladder. In about two months he applied to me again, complaining of a return of symptoms of stone; he at the same time brought me a bottle of mucous, which, upon analysis, was found to contain upwards of thirty per cent. of phosphate of lime. On his next visit I sounded him, and although I could not discover any stone either with the sound or the lithotrite, I distinctly felt a roughness on the surface of the bladder, as if it had become coated with phosphates, to which I attributed his symptoms. I therefore injected his bladder with a weak solution of hydrochloric acid, which tended to increase the quantity of phosphates rather than diminish them, for I not only found the injection, which I drew off about five minutes after its introduction, containing phosphate of lime, but the quantity in the mucus continued the same, and sometimes even increased. I considered, therefore, that the acid increased the irritation in the bladder, and so created a disposition to the deposition of phosphates from the urine equal to the quantity it dissolved. I therefore ceased to employ it, prescribing liq. potassæ and laudanum, under which treatment the patient perfectly recovered.

A second case, which I treated precisely in the same manner, terminated similarly in every respect; and my experience, therefore, leads me to believe, that little benefit is to be derived from the injection of acids into the bladder in such cases. Still there can be no doubt, that the science of chemistry, aided by the use of the microscope, is more applicable to the diagnosis of urinary diseases than to any other to which the human subject is liable; and I believe that in those classes of diseases in which an abnormal condition of the urine constitutes one of the earliest symptoms, their application is almost indispensable.

It is well known to every practitioner in medicine, that very slight disturbance to the health, any trifling functional derangement, is quite sufficient to cause the urine to assume an appearance so foreign to its natural state, that the most cursory observer cannot fail to be impressed with the change. A slight cold, an attack of indigestion, a meal of some particular kind of food, or other accidental circumstance, may be sufficient, in some constitutions, to produce a change in the appearance and character of the urine; but it is equally true, that such a change may result from some severe constitutional disorder, and prove indicative of a state of health most dangerous to the patient's safety. The urine, when in a state of disorder, (either from the trifling causes alluded to, or in consequence of the more serious deterioration) amongst other changes, often loses its normal transparency and colour, and becomes loaded with a more or less abundant deposit of an opaque solid nature. Now without entering into the subject of the peculiar changes to which the urine is liable under different forms of disease, or of the indications furnished by these abnormal characters, it will be sufficient for the purpose of proving the applicability of chemistry and the microscope to take the case of urine containing a visible opaque deposit. Such a deposit may arise from many different causes, and may consist of matters differing extremely from one another, and indicative of totally opposite conditions of the constitution; it must, therefore, be very important to be able to distinguish these various deposits from one another, inasmuch as the treatment of the patient must be regulated according to the nature of the urinary deposits, as pointing out very generally, the origin of the evil, as to whether it arises from trifling functional disorder, or from severer constitutional lesion.

So much do these urinary substances vary, and still sometimes so resemble each other in appearance, that it is often extremely difficult to distinguish between them by the ordinary means of observation; and I think I may venture to state, that, under certain circumstances, it would be impossible, by the unaided senses, to determine whether such a deposition consisted of uric acid, urate of ammonia, phosphate of lime, mucus or pus; for when examined by the naked eye, the deposits of any of these ingredients vary but little in character, at any rate afford but a slight guide to medical practice. The case is widely different when such deposits are subjected to investigation by means of the microscope and chemistry. Under the microscope, that which was confused and amorphous resolves itself into characteristic forms, easily recognisable, and indeed unmistakeable to the practised eye. In some cases, however, in which form is not always sufficient to satisfactorily decide the point, as may occur in deposits of phosphate of lime, urate of ammonia, or uric acid, chemistry steps in with her menstrua, and at once determines it beyond any further question. To illustrate the advantages of being able at once to ascertain the nature of a urinary deposit, let me advert briefly to the different circumstances under which deposits of totally different characters may be produced, although, to a certain extent, presenting the same appearance to the naked eye. We have deposits formed in the urine under certain constitutional conditions almost diametrically opposite to each other: checked perspiration, slight dyspepsia, excess of nitrogenised food, an attack of fever, and other causes of a similar nature, will probably produce the determination of an excess of nitrogenised matter to the kidneys, to be ejected from the system in the form of uric acid, or urate of ammonia. On the other hand, phosphate of lime seems to be directed in excess to the urinary organs when there is not sufficient vital power in the system to carry it to those tissues which normally require a certain supply of this compound; when, therefore, phosphate of lime is found in the urine, we may expect to meet with great constitutional and nervous depression in the patient, which is in a condition that yields with great difficulty to the influence of medicine: the presence of the triple phosphate is also indicative of the same condition. It is by the aid of the microscope and chemical tests only that these deposits can be distinguished from one another, and thus their forms, crystalline or otherwise, can be appreciated under the microscope, while their relation to chemical solvents affords an unerring guide to their true nature; which, being ascertained, the diagnosis and appropriate treatment is rendered comparatively easy. For the just estimation of the value of these facts, I cannot do better than again revert to my friend Dr. Golding Bird's most excellent work on 'Urinary Deposits,' which is equally adapted, from the depth of its research, to benefit the established practitioner and the student in medicine.

I had a case related to me lately by Mr. Iliff, jun., of Newington, which, although from the character of the disease, it may not appear a very important one, still bears so strictly on the subject before us, viz., the use of the microscope in arriving at a just diagnosis, that I shall relate it. Mr. Iliff had a patient who was the subject of a cutaneous eruption, which, in some respects resembled scabies, but still, from the high degree of erythematous inflammation, there was some doubt on the subject; Mr. Iliff, however, applied the sulphur ointment, which directly so aggravated the diffused inflammation of the skin, that he discontinued it, and consulted Mr. Erasmus Wilson, who had also at first some doubts as to the nature of the disease, but settled the question at once by the following plan: with a needle he scraped off the cuticle from one of the pimples, and then insinuating its point into the base of the elevation, he soon withdrew the little animalcule, which, although scarcely discernible by the naked eye, when placed under the microscope, was at once recognised as the acarus scabiei, which immediately settled the question.

The detection of spermatozoa in the urine may indicate the propriety of a change of discipline and treatment that may snatch a patient from the jaws of death, and this source of depression could not be detected without the use of the microscope.

In conclusion, I must beg leave to impress upon my readers that by this commendation of the use of the microscope and chemistry, in relation to diagnosis, I have have had no intention, whatever, of inculcating any neglect of the usual means which are employed in the investigation of constitutional symptoms, the due performance of the natural functions, and local appearances, as a means of detecting the sources of disease; but would merely show, that as the sound in the detection of a stone, and the stethoscope in the examination of the disease of the chest, are the physical means of improving the sense of touch and hearing, so may the sense of sight be exalted by the microscope, while the science of chemistry is competent to the development of facts which the senses themselves are totally incapable of arriving at.

I remember when the stethoscope was first introduced in this country, an excellent physican, although perhaps an old-fashioned one, ridiculed the use of the instrument, and said, "I never could be an advocate for the introduction of an instrument as an aid to the practice of medicine, which has a tendency rather to substitute the senses for the sense of the practitioner; but this was, indeed, a short-sighted view, as the stethoscope is only intended to be employed as a means of extending the sense of sound, thus rendering that avenue to the brain more susceptible to the impressions arising from the morbid indications, than the unaided ear could ever be. Such, indeed, is the only use I would wish to propose, of the microscope and chemistry in medical practice, not with a view, indeed of shortening the road to the formation of a just diagnosis, but to render its discovery more certain and unerring; and as the mathematician employs certain formulæ in proof of the correctness of his calculations, so may the use of chemistry in many cases be called in aid by the pathologist, as the test of the accuracy of his previous deductions.—*Guy's Hospital Reports, Vol. vii., p,* 105.

159.—CHEMICAL REMEDIES—CAUSTICS—CAUTERIES.

By Dr. Douglas Maclagan.

[These remedies, says Dr. Maclagan, may be used for their mere primary or chemical effect to destroy texture, and in this view they have been applied practically to the following purposes :]

To open Abscesses.—There can be no doubt that in nineteen cases out of twenty the proper way to open abscesses is by the knife, as it is equally effectual, more expeditious, and less painful than caustic; and where the matter is at all deeply lodged, in short, where there is any more over it than integument, escharotics as a means of opening it are out of the question. The principal indication for the use of the caustic (the cautery is never used for this purpose) is where a large portion of the skin has become attenuated and discoloured, all of which must be got rid of before a healing sore can be formed; and this can be more readily accomplished by the destructive action of the caustic than by trusting the case to the slower process of ulcerative absorption. I do not know that I can state this indication more precisely; but what I have been generally guided by is this—if the attenuated skin is of a circular form, so that when divided by the knife in any direction it must leave broad thin flaps, which will be long of ulcerating away, I then employ the caustic, though I must say that occasions for preferring it to the knife are rare. It is not requisite to rub the caustic over the whole surface of the skin which we wish to destroy; it is sufficient to apply it round the edge where the healthy and the thin skin meet, and the whole of the latter being, as it were, included in a ring of eschar will perish. This plan answers very well in large buboes, especially in scrofulous subjects, where the skin is apt to partake largely of the unhealthy character. When, however, the attenuated portion of skin, though large, is long and narrow in shape, the knife is to be preferred; here you will not be troubled with broad flaps of unhealthy skin; and, remember that, by using the knife, you always give your patients much less pain, though patients will not always be persuaded of this till they try it, and will sometimes, from a foolish horror of anything that savours of an "operation," allow you to inflict upon them a great deal of unnecessary suffering, rather than permit you to relieve them in a few seconds by the bistoury. If the abscess has opened spontaneously, and there is much unhealthy skin, and also unhealthy granular or cellular tissue below it, the caustic had better be used at once, as all this has to be got rid of before a cure can be accomplished. Under such circumstances, thrust the piece of caustic into the opening, turn its point up so as to rub the skin on the inside, thrust it once or twice into the unhealthy tissue beneath, and you will thus effectually destroy all that requires to be removed.

To destroy Morbid Growths.—This is not the proper place for discussing what forms of morbid growths may be treated by extirpation, and what are the circumstances under which we ought to refrain from interfering surgically, and restrict ourselves to palliative treatment. When, however, in accordance with surgical principles, it has been determined that an attempt at removal shall be made, three methods of operating present themselves,—mechanically by the knife or by ligature, and chemically by cauterants. I think that it may be laid down as a general rule that, if we except such matters as warts and corns, which fall generally under the domain of domestic surgery, there are but few cases where we can recommend the cauterant as a substitute for the knife in the removal of morbid growths. It has no advantage in certainty of effect; it is not so safe as the knife is in the hands of a person of proper dexterity, and competent anatomical knowledge; the wound left by it, when its proper action is over, will not heal so readily as that made by the scalpel; and, therefore, ever since surgeons became more fortified with means of arresting bleeding from wounds, the cauterants have been very generally superseded by the knife, and in some cases the ligature, for the removal of morbid growths. There still, however, are found in surgical works, and still more in empirical surgical practice, statements to the effect, that some forms of local disease,—as, for instance, open cancer,—may be removed by caustic, where the knife cannot be employed. I think no one can hesitate to say that this is against all true surgical principle. When a disease, either from its nature or its situation, is unfit to be subjected to the knife, *a fortiori* it is unfit for extirpation by an agent which must of necessity be more or less uncertain in the extent of its destructive operation: and although, perhaps, now and then a malignant-looking sore has been healed in this way, yet in by far the greater majority of instances the disease is either directly aggravated, or only very partially benefited—and above all, it is obvious that no proceeding of this kind can give any better chance to the patient of exemption from the recurrence of the disease, or its attacking neighbouring parts, which is the great impediment to operative interference.

I have, for instance, seen small cancerous ulcers of the lip cured by caustic. I saw some of these treated in this way by chloride of zinc when it was new as a caustic, and, therefore, for a while fashionable, and esteemed wonderful. I have also seen some of these sores of the lip which were treated by a druggist's shopman in the country. I had no opportunity of tracing any of his cases from beginning to end: but I mention this man's practice both on account of the destructive agent used by him—powdered arsenic—which, however, is perhaps hardly a true caustic,—and the means which he employed to prevent the poison getting into his patients' mouths. He used bird-lime for this purpose, making a little hollow disk, into which he put the arsenic, and stuck it firmly on the part, leaving it in contact for about six weeks, when a slough came away and the ulcer healed. Of course, I do not recommend this practice for your adoption; not that it was unsafe as regarded the arsenic, for I never could ascertain that any of this man's patients were ever affected with symptoms of poisoning, but that, in reality, there was nothing in its success, such as it was, to recommend it: for a V shaped incision would have removed and cured in a few days any of the cases which I saw; whereas, when he did succeed, he took at least two months to effect it. I have also seen the actual cautery applied to malignant ulcers under the auspices of a high surgical authority in a continental school, and the clinical lesson which I then got was one which will serve me for the rest of my life. I saw three cases of open cancer deeply burned with the cautery,—a proceeding horrible enough to witness, but still more so when the result was seen. All three died from this operation, and two at least of them were affected with purulent deposits in internal organs.

It may, however, be legitimate to use the caustic in malignant disease, where the tumour, from its mere bulk or situation, is such an annoyance to the patient that the surgeon removes it so far as he can as a palliative measure. He may then apply a caustic to the base of the tumour, either to arrest hemorrhage, if troublesome, or, if he is compelled to leave part of the tumour, to prevent its speedily growing again, and keep it in check. I have seen such cases occur, but they are very rare, and must be looked upon as deviations from ordinary surgical rule for a special palliative purpose.

There is one form of morbid growth to which the caustic is generally held to be particularly applicable. I allude to scrofulous tumours, especially when they have passed on to that unhealthy suppuration which frequently occurs in the course of them, and which leaves fistulous sores or flabby ulcers surrounded by hardened scrofulous tissue, in which it is very difficult to produce any approximation to a healing action. In such a state of matters destruction of the diseased tissues by caustic is an established mode of treatment. When it occurs in the ordinary lymphatic glands, in situations where a cicatrix will not cause much deformity, the caustic locally, with constitutional treatment, answers well; but when we wish to avoid having a large cicatrix, as on the neck, we eschew caustics, and try to obtain a less deforming, though more tedious cure, by stimulant applications, conjoined with constitutional remedies. When more important glandular organs are affected, as the testis and mamma, the caustic freely applied will eventually produce a cure; but it has appeared to me that, in many such cases, where the organ has been extensively invaded by the disease, even though we feel confident that a cure will ultimately follow, it would be far better to have recourse to the knife. I have seen, for instance, a scrofulous mamma in an elderly woman the subject of consultation. It has been urged, and with truth, "That should heal sooner or later; apply the potash freely and you will cure it." But, in such a case, what is the ultimate result?—a cure, no doubt, but at the expense of much suffering to the patient, and ultimately leaving a breast which, even if the woman were within the child-bearing period of life, would never be of any use to her as a nurse. It appears to me that, when we can cure such a disease with caustic, only by leaving the useless remains of a mamma behind, it is a shorter process, and one entailing no greater ultimate injury, to excise the diseased organ. The same applies to the testicle when it is extensively diseased, and is more frequently acted upon with regard to it; and it also holds true of scrofulous disease in other external parts. It is true that an operation is to be regarded as the last resource of surgery, and should not be undertaken when there is a reasonable prospect of a cure without it. It is also true, that even very bad cases of external strumous disease may be cured by caustic; but it is always to be considered, in following this practice, whether, what we save by such a cure is to be of any use to our patient, and whether it will ultimately be worth all the protracted suffering which has been undergone in obtaining the result.

There are some forms of local disease which have no pretensions to be called malignant, but which are very intractable, being slow to heal and apt to spread, which it would be well if we could extirpate bodily, and substitute for them a clean wound, but which, from the extent of the surface involved, and the situation of the parts affected, admit of no such proceeding. The troublesome disease of the face called lupus, and some of the forms of chronic ulcer, belong to this category. To these cases caustic is generally applicable; the object in using it, however, being, not to extirpate the diseased textures, but rather to alter the action of the parts, and thus lead to the formation of a sound cicatrix. The absorption of solid matter effused into and below the skin is probably one of the chief beneficial effects of the application of the caustic to such cases; the indurated edges and base of the ulcerated portion are thus removed, and cicatrisation can then go on.

There is one form of morbid growth which I think may be treated with the cautery more than it usually is.—I mean the erectile tumours of the skin in children. These, which consist essentially of a congeries of enlarged blood-vessels, are commonly treated by ligature; but this causes a good deal of suffering, and often much constitutional irritation, before the strangulated mass finally separates. The method of applying the cautery is to pass a large red-hot surgical needle, which may be readily heated by a gas flame, once or twice through the base of the tumour, and the object is to cause effusion of lymph, and thus to alter the structure of the tumour and arrest its growth. There are other means of effecting this object; but I mention this as one which, though noticed in surgical works, has not received that attention which I think it deserves.

To complete the Destruction of Sloughing Textures.—Thus, in phagedenic ulceration, as in cancrum oris, phagedenic chancre, and the bad action which so often attacks sores in hospitals, thorough cauterisation of the parts ought to be had recourse to promptly. It not only expedites the separation of the sloughs which have already formed, but, by a kind of allopathic action, substituting a chemical for a morbid vital process, it arrests the progress of the affection, and gives a healthy character to the sore. In these cases the fluid caustics, such as strong nitric acid, are the best, as they penetrate into all the nooks where the diseased action has established itself.

To prevent the Effects of Poisoned Wounds.—Cauterants are also used on account of their chemical agency in cases of poisoned wounds, and in the early cases of chancre, which in this respect is regarded by many as a kind of poisoned wound. According to Ricord and others, if what is called a true venereal chancre is thoroughly cauterised during the first three or four days, constitutional symptoms never follow; and this is explained by saying, that the surface secreting the poison is thus destroyed, and the virus is prevented from getting into the system. Whether this be the true explanation or not, I need not stop to discuss; there can be no doubt that free cauterisation is the best treatment for primary sores, whether during the first three or four days or later, and all the more so if the edges and base be indurated; and when the slough separates we generally have a healthy sore left, which heals under simple treatment.

With regard to poisoned wounds, as those from dissecting punctures, and by the bites of snakes and rabid dogs, there appeared to be good reason to think that the caustics are useful, both by their chemically destroying the organic poisonous matter, and by their cauterant action closing up the vessels of the part, and thus preventing absorption. The use of the caustic does not supersede the necessity in such cases for trying to prevent the ingress of the poison into the system by suction of the part, encouraging it to bleed or by excision of the whole tract of the wound. The fluid caustics have been recommended as being likely to reach thoroughly to the bottom of these punctured wounds; but, if the inquiry be of such a form, it is better to dilate it freely, and thus get room for applying a solid caustic efficiently over every portion of the wound.

To arrest Hemorrhage.—I have already told you, that when a cautery or caustic is applied to a raw surface, such as a wound, there is coagulation of the blood or other fluids on the surface, and that the subsequent effects are the same as when the chemical agent is applied to unbroken skin,—that is, there is shrivelling up of the texture, the formation of a slough, subsequently the occurrence of inflammation in the contiguous parts, and lastly separation of the slough. In the arrestment of hemorrhage by the cautery or caustic, all these actions come more or less into play; first the blood on the surface is coagulated, and thus so far forms a mechanical impediment to its further escape from the vessels; but this would be of little avail were it not for the further action of the cauterant on the divided vessels themselves, which, becoming shrivelled and contracted, offer a still further impediment to the flow of blood. Most probably the blood in the vessels of the cauterised part is coagulated also: and thus the primary effect of the cauterant appears to be, to form a clot both without and within the vessel, at the same time that it contracts the open orifice, and thus the flow of blood becomes arrested. But it is clear that so soon as the eschar separated, the bleeding would be renewed, did not the cauterant produce a further effect, which renders the closure of the vessel permanent; this is the inflammatory action which takes place in the textures contiguous to the cauterised portion, and which leading to the effusion of fibrinous matter, completes the cure by permanently shutting up the vessel,—and thus, when the slough separates, there is left merely an ordinary suppurating sore, and no further bleeding occurs. The whole point, then, on which the efficiency of the cautery or caustic, or indeed, any of the other means of arresting bleeding depends, is whether the temporary occlusion of the divided vessels will be able to hold its ground till they have been permanently closed by vital action? Now, in regard to the larger arteries, it is found that this is not the case; the coagula of blood formed, and the corrugation of the orifice of the vessel caused, by the chemical agent, are not sufficient to resist the impulse of the blood; and, therefore, even were there not other objections to its employment, the cauterant would be deservedly rejected, on the score of inefficiency as a general means of arresting bleeding from large vessels. I presume that few of you need to be told, that for this purpose the ligature is the truly efficient and trustworthy resource of the surgeon, and that in all cases where a vessel can be laid hold of and tied, this is the course to be pursued. When this cannot be done—as, for instance, where the bleeding vessel cannot be brought into view, or where the blood is escaping, not from one or two large, but from a multitude of small vessels—pressure is had recourse to; and when we can employ neither pressure nor ligature, we then may have recourse to certain applications, which will produce temporary arrestment of the bleeding, and keep it in abeyance till permanent closure of the vessels occurs. Such applications are called styptics. Some of these, such as cold, act vitally, by producing a constriction of the vessels; some, as alum and other astringents, act partly vitally, and partly, probably, by chemically coagulating the escaping blood, and in slight forms of bleeding this means will often succeed; but when we are deprived of the use both of ligature and pressure, and when the hemorrhage is too active to be controlled by the ordinary styptics, we then have recourse to the more energetic action of the cautery or caustic, as described above.

It is not requisite for me to specify particular cases to which this is applicable—an example will suffice. Take the instance of leech-bites on a child's throat. Here we have no large vessel bleeding, but a number of small open orifices; the ligature is not applicable in the ordinary way,—the situation of the bleeding wounds, of course, prevents our making anything like efficient pressure; we may try cold and other astringents, and in the very vascular skin of a child will probably find them to fail; and we then have recourse to our caustic, which will in general be found to succeed.

Or take the instance of hemorrhage from the jaw, after the extraction of a tooth. There is probably a pretty active vessel bleeding, but, being at the bottom of a narrow cavity in a bone, it cannot be laid hold of and tied; pressure may be tried, but the patient will not suffer it to be maintained, from the pain which it occasions in the lacerated gum; we may then have recourse to our caustics, and a liquid one, such as the acid nitrate of mercury, will be advantageous, as it will more readily penetrate to the bottom of the cavity; and, should this fail, we may then employ the actual cautery, using for the present case such an instrument as a red-hot wire.

In using cauterants for the arrestment of hemorrhage, one or two particulars require to be attended to. All clots should be removed from the wound, —it should be cleared of blood by a few moment's pressure with a bit of dry lint,—and the cauterant immediately applied. By this means we secure the advantage of exposing as much as possible the very point from which the blood flows, and thus we can apply the cauterant with more precision; and, by having the wound free of blood at the moment of its introduction, we do not expend its chemical action on escaped blood, but carry it at once and directly to the bleeding vessels.

In cauterising to arrest bleeding from a cavity, as a leech-bite or the alveolus of the jaw, it is obviously essential that the caustic or cautery penetrate to the very bottom of the wound; for the chief source of the hemorrhage is most probably in this quarter; you ought, therefore, to be sure, before applying your caustic or cautery, that it can reach the very bottom of the cavity. I have, in the case of leech-bites in children, seen a piece of caustic applied to the wound, cause much pain, and yet leave the bleeding as active as ever, simply because the piece of caustic was too thick to reach the bottom. Though it is a matter of individual detail, I may mention that, in cauterising leech-bites, I have often had recourse to a simple and ingenious way of making a fine piece of caustic, which was recommended by my late friend Dr. James Hunter, viz., to break off a piece of nitrate of silver from a common stick of caustic, crush it to powder, heat the point of a silver probe in a candle, and dip it into the powder; it thus becomes crusted with the nitrate, and forms a fine button of caustic, which will easily reach the bottom of any such wound. Lastly, when the bleeding has been stopped, beware of injudiciously meddling with the part. Remember that the occlusion of the divided vessels is as yet only temporary, and may be easily overcome, till the vital processes have been perfected which make the vessels permanently secure. Therefore let the part be touched as little as possible, and wait patiently for the spontaneous separation of the slight slough which is formed.

Such are the uses and applications of the cautery and caustics, which are founded upon their mere chemical and destructive effect. We saw that the second stage in their action is the production of an ulcer with suppurative discharge. This, as a matter of course, follows the application of cauterants for any object; but sometimes we make use of them to obtain this very result for certain purposes. This is when we wish to employ them as counter-irritant agents, and when we desire to keep up the counter-irritation by the establishment of an issue. As we shall, however, have to consider the whole subject of counter-irritants hereafter, I reserve for a future occasion what I have to say respecting the use of cauterants for this purpose.

There remains, then, only one more of the effects of cauterants which has been turned to useful purposes, viz., their power of forming a contractile cicatrix, and on this point a very few words will suffice.

This effect of a burn, which in cases of accidental injury, often results in very serious deformity, has been applied by surgeons to procure a closure of preternatural openings, which, having become callous on the edges, have lost all tendency to contract naturally, such as vesico-vaginal fistula, preternatural anus, venereal ulcers which have perforated the soft palate, &c. The object which is here in view is to produce a slight artificial burn on the edges of the opening, to allow this to heal, and to gain the advantage, which the contracting tendency of the cicatrix affords, for diminishing the size of the aperture.

It is obvious that to do this successfully, the cauterant must not be applied to such an extent as to produce destruction of tissue, because, if a considerable portion of the edges of the opening were burned away, the sore, when it did cicatrize, would have to compensate, by its contraction, for this loss of tissue, and would not have improved the original malady, nay, might rather aggravate it. In attempting, therefore, to procure the closure of such openings by cauterisation, all that is to be done is to produce enough of inflammation of the edges to cause them to become raw and sore. This inflammation, which is accompanied by some swelling of the parts, often produces at first an apparent direct amendment—the passage of the urine into the vagina in one case, and the escape of fæces in the other, being lessened for a while. But the surgeon knows that this is only temporary; after a day, or even in a few hours, this inflammatory swelling subsides, the escape of fluid is as great as before, and the patient is disappointed. But the surgeon knows that it is not till after this that he is to look for the expected benefit. The sore made by the cauterant is allowed to heal, which it will take some time to do, and now it manifests a tendency to contract, and the orifice, though not closed, is lessened. A cure is not to be obtained, and must not be looked for, from one cauterisation; the same process must be repeated again and again; but this must not be done too soon. An interval of some weeks—sometimes even of some months—should be allowed to elapse before another cauterisation is practised; for, if it be repeated too soon, we interfere with that very part of the process on which the obtaining of a cure depends. It is quite a pathological mistake to suppose that the contraction takes place only when the sore is granulating. From the observation of accidental burns it is quite established that the tendency to contraction continues for some time after the sore of a burn is quite cicatrized. The necessity, therefore, for leaving a sufficient interval between one cauterisation and another is obvious, if we wish to avoid undoing by the second what has been accomplished by the first, and the precise time which is to be allowed must depend upon the extent of the disease and the effect of the first cauterisation. By thus making a succession of slight burns of the edges of the opening, each followed by a certain amount of contraction, we may ultimately close the orifice.

Both caustics and the actual cautery have been used for this purpose, some surgeons preferring the cautery as more decided in its effects, others the nitrate of silver as more manageable. The truth I believe to be that either will answer if the amount of cauterization be duly regulated.

It is right to say, however, that this proceeding is hardly applicable to openings of large size, and that in such cases, if a cure can be achieved at all, it is most likely to be obtaind by paring the edges with the knife, and bringing them together by suture. Sometimes by such an operation, a great part of the orifice may be closed, but one small portion refuses to unite; and in such circumstances the cauterant method may be applied to this part to complete the cure.—*Monthly Journal of Med. Science, Nov.* 1850, *p.* 451.

160.—NATURE AND CAUSE OF CHOLERA.

By Dr. R. D. Thomson.

[The following are the conclusions which Dr. Thomson arrives at, after a lengthened and elaborate chemical research into the nature and cause of this mysterious disease.]

1. That the incipient stage of cholera does not differ materially from the common forms of diarrhœa, inasmuch as its treatment is successfully managed

by similar means; and this result may lead to the inquiry,—Does not the removal of the symptoms of the disease by narcotics, and therefore, the retention of the fluids in the system, afford an argument against the idea of a morbid poison being the cause of cholera?

2. That in the second stage of cholera, a lymphatic fluid is diffused from the blood into the intestinal canal, corresponding exactly in chemical composition with that secreted or diffused through the serous membranes in hydrocele and hydrocephalous, and other forms of dropsy. Compared with healthy blood, it appears, that the salt which is diffused most largely into the intestines, is common salt, while the albumen of the blood possesses this power of transference generally in a very limited degree. The facts seem to show, that in this stage, instead of as in the natural state, the diffusive power of the mucous membrane being exerted from the intestines towards the blood, the reverse action occurs; thus pointing to a parallelism with purely physical phenomena. Conjoined with other characters, they supply an argument for the inquiry—May not cholera be an *epidemic intestinal catarrh*, influenza being an *epidemic respiratory catarrh?*

3. In the third stage the lymphatic fluid ceases to be poured out from the blood. The bile is excreted, and the normal diffusion from the intestines to the blood resumes its action.

4. There is no evidence of the existence of any organic body in the atmosphere during the prevalence of cholera, and hence the inquiry is suggested—May not this and parallel diseases which are not contagious, such as ague, be principally due to meteorological and physical influences, acting on debilitated habits, and thus a distinction be established between them and contagious affections produced by morbid poisons, as typified by small-pox?—*Med. Chirurg. Transactions, Vol.* XXXIII., *p.* 97.

161.—CASE OF DISEASE OF THE BRAIN.

By Dr. R. B. Todd, F. R. S., &c. (Reported by H. H. Salter, B. A., Dem. Anat. K. C. L.)

[William Ware, a ploughman from Kent, was thirty years of age, and of temperate habits. About fifteen weeks before his admission, he was suddenly seized with paralysis of the right side of his body and face. He seems, after this, to have lain in a heavy sort of stupor for some weeks. After the recovery of his consciousnes, he continued for three weeks in a state of complete paralysis of the right side. On admission, however, he had somewhat recovered from the paralysis, and he could use the right leg very well, and the arm slightly. Dr. Todd thinks in this case, as the affection was chiefly motor, we may guess at its locality. He thinks it would be in the left corpus striatum, or in that part of the hemisphere which is most intimately connected with it, as this portion seems most intimately connected with the motor function. As to the nature of the affection, it might have been from a clot of blood, from a ruptured blood-vessel, or from a more slow disease of such a nature as to be capable of producing sudden paralysis—a gradual softening of the substance of the brain. Dr. Todd inclines to believe that this last is almost always the precursor of apoplexy. The artery or arteries leading to the parts are diseased; that portion of the brain fails in its nutrition; passes into the state of white softening; the minute vessels give way, and allow the blood to escape into the tissue of the brain. Another way in which paralysis may take place is by an inflammatory state of the brain substance, producing softening of a different kind to that mentioned, and in which there may or may not be rupture of fibres; but there may be deposit as the result of the inflammation, which, by its pressure, may interfere with the conducting power of the fibres. Dr. Todd proceeds:]

Now I have mentioned the opposite condition of *white* and *red* softening. These are apt to come on under opposite circumstances. *White* softening may be caused by anything that diminishes or cuts off the supply of blood to the head. In some cases, in which the carotid artery has been tied for aneurism, and the supply of blood to the brain on that side thus stopped, the patient may go on very well for a short time, and there may be no impairment of function;

but during that time the process of softening has been gradually going on on that side of the brain which is supplied by that carotid; and in a day or two the softened fibres cease to maintain their continuity, and give way, and paralysis ensues.

Some years ago I attended, along with my friend Mr. Street, of Norwood, a very remarkable case of this sort. The supply of blood had been cut off by a dissecting aneurism, which had plugged up the common carotid artery on the right side, and paralysis of the left side of the body took place. We were much puzzled to account for the paralysis till after death, when the post-mortem examination cleared it up. The account of this case was published in one of the volumes of the 'Medico-Chirurgical Transactions.'

There is abundant evidence to show that under ordinary circumstances white softening is *atrophic*—i. e., dependent on imperfect nourishment of the brain and non-inflammatory. But it may exist on the confines of genuine inflammation, the nutrient fluid being diverted from it to the inflamed portion, or it may exist around an effusion of liquid in the ventricles, that effusion being possibly inflammatory in its nature.

The second sort, the *red* softening, is inflammatory. I show you here a very good representation of it, which was made from a case of mine some time since. The portion of the brain affected was of considerable extent; there was paralysis, of course, on the opposite side; there was a stupid, comatose condition, not complete coma, and loss of sensibility, which continued till the patient died. But the paralysis came on gradually, and not till after these comatose symptoms had existed some time.

Now of these two conditions I think we may very justly attribute the symptoms in our patient Ware's case to a white softening, followed by a rupture of blood-vessels, and an effusion of blood.

The numbness, which he described as having occurred before the paralysis, indicated that morbid changes were slowly creeping on, and after a time rupture of the blood-vessels, and disruption of fibres, took place, when followed the paralysis and the three weeks' stupor. The former being very complete, denoted a very complete solution of continuity on some part of the centre of volition; the sudden stupor implied that pressure existed within the cranium, but only to a moderate extent, for a large effusion, capable of producing such a complete paralysis, would undoubtedly have caused profound coma.

This, I say, seems the *most probable* train of morbid processes, at the commencement of the case; but we cannot speak on this subject with great certainty, for we cannot fully depend on the accuracy of the patient's history of himself. It tallies, however, very well with what we observed of his subsequent history, and of the post-mortem examination.

A train of phenomena, however, very similar, but differing as regards the *sudden* supervention of the paralytic state, might have occurred, when the primary lesion was of the inflammatory kind.

Upon examination of the brain after death, it was found that a considerable portion of the corpus striatum of the left side was completely destroyed and excavated, and that the cavity was filled with a creamy fluid, having somewhat the appearance of pus; the anterior and inner part of the corpus striatum was healthy, but the whole of the posterior and outer part was thus disorganized; a few bands of fibres, easily broken down, passed from one side of the cavity to the other. The creamy matter contained in the cavity was found, on microscopical examination, to contain great numbers of large cells, containing oily matter in large globules, and also in a state of extremely minute subdivision. These curious organic globules might suggest the idea, that some active reparative process was going on during life. What their precise signification is, I do not pretend to determine; but I think I may affirm that they are characteristic of a state of white softening, as I have found them in other cases, in which no doubt could exist of the atrophic nature of the lesion.

It seems almost certain, then, that this excavation of a portion of the corpus striatum must have been due to a white softening, followed by an effusion of blood, and which was the immediate cause of the breaking down of the fibres, and of the pressure which gave rise to the paralysis. No traces of blood remained on the diseased part, as no doubt there had been ample time for the disintegration of its particles, and for its absorption.

At first the paralysis was very complete, but afterwards the patient recovered a certain amount of power, especially in the lower extremities. If the paralysis had been accompanied with rigidity, I should have been led to the conclusion that the cerebral lesion was of an irritating nature. This rigid state of the paralysed limb (*when it comes on at the same time as, or very soon after, the paralysis*) is generally seen when some superficial part is affected, as the meninges, or the surface of the brain, or when there is a growth from the skull, or a tumour in the hemispheres, in some cases of inflammatory softening, or in some conditions keeping up a constant irritation; but when there is simple rupture of the fibres of a deep-seated part of the brain, as the corpus striatum. with or without pressure, there is no irritation: the paralysed muscles are quite lax.

There was no appearance whatever of rigidity in the muscles of the paralysed limb. Now this is just the sort of paralysis (accompanied as it was by comatose symptoms) which would arise from a solution of continuity of fibres in the first instance, and from compression. A portion of the corpus striatum is destroyed, and the healthy part is compressed by the effused blood. On the absorption of the latter a certain amount of power had returned in the limbs; and it depended on the possibility of repairing the broken-down portion, whether a complete restoration would take place. That parts so much diseased would have ever been completely repaired seems extremely unlikely for two reasons—first because the arteries of the part did not seem in a perfectly healthy condition; and, secondly, because of the well-known tardiness of all reparative processes in the brain, where actual solution of continuity has taken place.

You remember that on several occasions we passed the galvanic current through the paralytic and the sound limbs in this case. This was done, as I explained to you at the time, for the purpose of ascertaining whether any irritant disease existed within the cranium at the seat of the paralysing lesion.

If, on passing the galvanic current, you produce less contraction in the paralysed than in the sound side, then you may judge the cause to be of a *depressing* kind; if, on the other hand, the contractions in the diseased limb are the strongest, then you may conclude that the condition of the centre which causes the paralysis is *irritative*. But then you may bear in mind that irritation is not always inflammatory.

The most important points in this case may be thus summed up.

First, through some diseased state of the assimilative process, the arteries of the brain become diseased, and an insidious gradual process of softening takes place; rupture of one or more blood-vessels follows upon this, with solution of continuity of fibres, and compression of the neighbouring healthy brain structure; after this we have absorption of the clot, and more or less attempt at reparation: it may be that some inflammation may take place around the clots, which may retard the process of recovery.

If you were called upon to treat a case of this kind from the beginning, what course would you adopt? If you can clearly make out that the lesion is not inflammatory, but on the contrary, due to defective nutrition, the less you interfere the better. Keep the patient in the horizontal position, with the head a little raised; let the head be kept cool; unload the bowels in such a way as will involve the least effort on the part of the patient; a large turpentine and castor-oil clyster is generally more expeditious than purgatives given by the mouth. Bleeding is generally not admissible in such cases as this, as it tends to increase the atrophic condition of the brain, and would under such circumstances, favour rather than repress hemorrhage.

When this patient came under treatment in the hospital, we did not at first administer any medical agent: he was kept quiet and nourished moderately. After one or two trials with the galvanism we observed, on one occasion, a little more excitability in the palsied limbs than in the sound, under the influence of the inverse current. Finding that he had made no progress for some days, I was led, from this effect of the galvanism, to fear that some inflammation might have set up around the lesion; and accordingly, I was induced to give him drachm doses of the solution of the bichloride of mercury—that is, as you know, the sixteenth of a grain of that salt three times a day. No good effect followed this treatment: on the contrary, I fear the salivation which took place sooner than might have been expected must have made him more susceptible of the poison of erysipelas.

After all, I must acknowledge that in this part of the treatment somewhat of the *nimia medici diligentia* was exhibited. It is a lesson hard to learn, and more difficult to act upon, that nature can do more than the physician; but it is a lesson which each succeeding year of increasing experience will impress upon you, and in no cases more than in those of chronic affections of the brain.—*Med. Gazette, Nov.* 1, 1850, *p.* 735.

162.—CASE OF DISEASED BRAIN CAUSING DOUBLE APOPLEXY.

By Dr. R. B. Todd, F R.S., &c. (Reported by H. H. Salter, Esq., B. A.)

[The following case seems to illustrate the mode in which white softening of the brain is apt to take place, and the way in which that disease favours the production of apoplexy. The subject of it, George Regan, æt. 59, admitted he had been in the habit of drinking a good deal of beer and spirits. He had suffered also, for a long time from an affection having the nature of gout.]

About two years ago he was seized suddenly while at work, at nine o'clock in the morning, with a feeling of stupor: as he happened to be working at home at the time, he laid down on his bed, hoping to sleep it off by dinner-time, but when he attempted to get up he fell, and found that he had lost the use of his right side: he then became comatose, and so continued for some days. Whilst in this state of insensibility he was taken to a neighbouring hospital, where he remained for two or three months, and at the end of that time in some degree recovered from his attack, but not so as to enable him to work as he had done before his illness.

During last October he had a *second* attack, of the same kind as the first, but less severe; the limbs were paralysed, as before, on the right side; he remained a few days in bed, and recovered in some degree the use of the arm and leg, but he has never been able to work since.

On Christmas day last, at nine o'clock in the morning, before he was up, he had a *third* attack; on this occasion he was delirious for a short time, and afterwards became insensible, but he recovered his consciousness in the evening.

This third attack brought on increase of the paralysis on the right side, so that on this occasion not only was the motor power affected, but the sensibility likewise. This latter function was so far affected, that he could not pick up small objects, and he would frequently let fall things which he meant to retain in his hand, and he staggered when he attempted to walk. It was more than three weeks after the attack when he was admitted, and the paralytic state had not improved; on the contrary, he thought it worse. His condition, on admission, was as follows: there was imperfect palsy of the right side, as shown by slight ptosis of the right upper eye-lid, and a slight hanging of the cheek, the features being slightly drawn to the *left* side. He would protrude his tongue straight, but his articulation seemed somewhat difficult. In walking he slightly dragged the right leg; the grasp of the right hand was moderately firm, but not *so* firm as that of the left; the muscles of the right leg and arm were flaccid, and less nourished than on the left side. The impulse of the heart was very strong, and a mitral systolic bellows sound could be distinctly heard.

For some days after his admission he suffered very much from constipated bowels, which it required the strongest purgatives to overcome.

He then began to complain of heaviness of the head, a disposition in his thoughts to wander, and a difficulty in collecting them. These symptoms appeared to me to portend the approach of another attack, such as he had on three former occasions. His remarkably sallow complexion and general leucophlegmatic appearance led me to suspect the existence of renal disease, resulting from that particular form of kidney—small and atrophied—which so frequently accompanies a gouty condition. This opinion was confirmed by the characters of the urine, which was pale, of low specific gravity, and slightly but distinctly albuminous. With this view, and imagining that the uneliminated urea might be contaminating the blood, and affecting the brain, I ordered him to be freely blistered at the back of the neck. This seems to have somewhat relieved him, for the next day he was reported to feel rather easier as to his head, and to have more power over his thoughts. At nine o'clock, however, on the following morning, the house-physician, Mr. Armitage, was called to him in consequence of his having been suddenly seized with a fit; he found him completely paralysed on the *left* side, both as to sensibility and voluntary motion; his left eye squinted, and was twisted downwards and inwards; at every respiration his left cheek puffed out from want of power of the buccinator: the right leg and arm moved when pricked, the left not; his breathing became louder and more sterterous, his coma deeper, and at last he died.

There was in the attacks to which this patient was subject a curious combination of the epileptic and the apoplectic, the one following upon the other. At the foundation of them, no doubt, was the diseased state of kidney. The first attack of sudden stupor was probably a slight epileptic seizure, the effect of which was a disturbance in the circulation in the brain, and the giving way of some small vessels—a slight apoplexy, with compression and rupture of fibres, and consequent paralysis.

Whilst the one or two small clots which had been effused on this occasion were undergoing absorption, and some attempt at reparation was taking place, he had another seizure of the epileptic kind,—a further disturbance of the circulation and nutrition of the brain on the same side, probably in the corpus striatum, or the fibres which pass from it to the hemisphere. But as the paralytic state appears to have been only slightly increased, and as the coma was of short duration, it is not likely that any effusion of blood took place on this occasion.

The epileptic character of the third attack was manifested in the delirium with which it was ushered in, and which ended in coma. There was a decidedly increased paralysis after this attack; but as quite as much paralysis is apt to follow the simple epileptic seizure, it by no means follows that any effusion of blood took place, although it is probable that such must have been the case, from the fact that the palsy showed no signs of improvement, as is generally the case with the epileptic palsy. As this attack occurred at a time when Christmas festivities are more or less prevalent, with all ranks and classes, it is very likely that the immediate exciting cause of the attack was due to over indulgence of some kind.

The fourth attack had in its premonitory signs all the characters of a threatening epileptic paroxysm; and knowing, as we did, the existence of renal disease, we were prepared for such an attack. The epileptic coma, however, soon passed into the profounder coma of a compressed brain; and as a new hemiplegic paralysis of a very complete kind showed itself on the left side instead of the right, it was easy to infer that a new and extensive apoplectic effusion must have taken place on the right side of the brain.

Assuming that the first three attacks were epileptic, followed by an apoplectic effusion, and that this effusion was due to a weakened condition of the arterial coats as the result of disease, it was quite consonant with experience to attribute the fourth attack to a similar cause, and to infer that arteries similarly diseased had given way on the left side of the brain. Most cases of rupture of vessels in the brain at the age of this patient take place from disease of the arteries; and it is very common, as was first pointed out by Bizot, for the arteries of the brain to be affected in a symmetrical manner—*i. e.* corresponding arteries of opposite sides will be similarly diseased, and to nearly the same extent. In this way disease had been, for some time, making progress in this man's brain symmetrically; there was first palsy of the right side, and then a similar condition of the left; and this simple fact of symmetry pointed to the arterial system as the seat of disease, and therefore to its usual result, apoplexy.

On opening the patient we found there was a double apoplexy corresponding to the double paralysis—one of long standing, and one recent—the first on the left hand, the other on the right. The original hemorrhage affected the corpus striatum and optic thalamus on the left side; and it was evident that the hemorrhage on this side did not take place at once, but on two occasions at least. The substance of the corpus striatum had evidently been the seat of the older effusion. It exhibited on section several bloody clots, and that peculiar yellow discolouration which always succeeds to a hemorrhage. The more recent effusion was a clot which had formed quite on the surface of the optic thalamus, extending likewise to the corpus striatum, and lodged in a depression on the surface of those bodies. We had thus an explanation of the cause of the original paralysis of the left side; and its imperfect nature was plainly due to the fact, that there was but little destruction of the corpus striatum, and that the compression of the latter clot affected chiefly the optic thalamus, and but slightly the corpus striatum.

But the apoplectic effusion on the right side was much more extensive; it involved parts corresponding to those affected in the first seizures, but to a much greater extent; and the brain substance was more completely torn up and destroyed. The clot was very large, and it entirely filled the right lateral ventricle, breaking through its roof, and tearing up the white substance of the cerebral hemisphere: it likewise tore up the corpus striatum, optic thalamus, and the septum lucidum, all which parts were completely swept away. This remarkable destruction was no doubt owing to a previous diseased state of the brain. I mentioned to you in my last lecture that it is very common for apoplectic effusions to be preceded by white softening: and when the softening has got to a certain extent, the brain substance is no longer an adequate support to the vessels, which, themselves more or less enfeebled by disease, give way, not in one point only, but in many, and the abundant effusion ploughs up the softened matter, quite destroys it, and takes its place: all this was the case in the present instance. The arteries of the brain were very generally diseased on both sides, and exhibited that symmetry to which I have alluded.

It is probable that the first part of our patient's last attack—the disposition of his thoughts to go wool-gathering—took place in connection with the softening; while the final catastrophe—the apoplexy and death—resulted from the hemorrhage to which that softening, coupled with the diseased condition of the arteries, inevitably led.

We found, likewise, as had been anticipated, a very diseased state of the kidneys: they were very contracted, the cortical substance much wasted, fissured, and granulated on its surface, the tubular substance healthy, and the capsule thickened. This condition of kidney, formerly described as the third stage of Bright's disease, is, in reality, a chronic degeneration or wasting of the kidneys, due to a deranged and damaged nutrition, for which I should be glad to find some other name than chronic nephritis: I have called it *gouty kidney:* and in this and many other cases this name is very appropriate. But it occurs in cases where there is no evidence of gout.

The result of the disease is to render the kidneys imperfect emunctories for the elimination of the urea, and other elements of the urine, which accumulate in the blood, and give rise to various morbid changes throughout the body, and are especially mischievous to the functions of the brain.

The heart and the arterial system were likewise extensively diseased. In the coats of the arteries were very numerous deposits of atheromatous matter. The heart was much dilated and hypertrophied, especially as regards the left ventricle. The fibrous basis of the valves was extensively thickened, apparently by some deposit, which rendered it opaque, amd impaired its flexibility; and, as is generally the case in this particular form of disease, *all* the valves were altered in this way: those of the right side, however, being much less diseased than those of the left. The semilunar valves of the arteries, especially of the aorta, had the fibrous festoons at their bases much thickened, the curtain of the valve being very little affected, and its function, therefore, but little impaired; and the cordæ tendinæ of the mitral valve were much thickened, and somewhat shortened, and the curtains of the valve also thickened. Similar changes had taken place in the tricuspid valve and its tendinous cords, but to a much less extent.

Taking, then, a general retrospect of this case, we find there is quite enough to account for all we have seen. The sequence of the events may be thus described:—First, the man gets into a general gouty condition, and the elimination of this morbid material gives rise to an irritation of the kidney, which at length assumes the form of gouty kidney, or, if you will, chronic nephritis; and this chronic nephritis incapacitating the kidney for the perfect discharge of its function is the cause of all the subsequent maladies: the blood becomes contaminated, deposits take place in the tissue of the heart's valves, in the large arteries, and in those of the brain; the diseased arteries of the brain become insufficient channels of supply, white softening is the consequence, and the unsupported and unhealthy arteries at length burst; and thus all the circumstances, from first to last, fall in regular order as cause and effect.

The deposits in the arteries produce a two-fold influence upon the circulation —by roughening the inner surface of the arterial channels they create a certain amount of direct obstacle to the flow of blood from the ventricle; and by diminishing, or nearly destroying, the elasticity of the arterial walls, they destroy one of the most important forces by which the circulation is carried on in the arterial system. Thus the arteries, from being elastic yielding channels, with perfectly smooth inner surfaces, are changed into resisting inert tubes, with rough inner surfaces. It is plain, then, that, under these circumstances, the heart has to encounter great obstacles, and to do a great deal more work than when the arteries are in their normal state. Hence the dilatation caused by the obstacle to the free flow of the blood; and the hypertrophy, by the greater exercise and effort of the muscle of the heart. The increase of force is merely remedial, to meet the increase of obstacle, and is one of those beautiful instances of self-adaptation to change of circumstances with which the animal organism, especially the muscular system, so much abounds.

As these deposits go on they impair the materials of the arteries of the brain; the degenerated walls of these vessels possess less strength, and are less able to support their contents. There is no undue determination of blood to the brain, but the reverse, for the blood that goes to the head has, in the erect posture, to be pumped up against the force of gravity; and, therefore, any obstacle in the course of the arteries would be more felt in this direction than in any other. It is a common notion that the hypertrophy of the heart gives rise to the apoplexy, by sending the blood with an undue impulse to the head; but for the correction of this error we need only remember that the additional force is merely such as is necessary for the exigencies of the circulation, and such as shall preserve the force of the blood's curreut as near as possible to the normal point, in spite of the existing obstruction. The actual force with which the blood circulates in the morbid arteries is most probably less rather than greater than in health. The apoplexy is, in fact, due to the diseased state of the arteries, which renders their walls an inadequate support to their contents, and to the diseased state of the brain, which imperfectly supports the arteries.

A vast number of the cases of apoplexy which occur about the period of life of our patient, or after the age of 50, are of this kind—a fact that has an obvious and an important bearing upon the question of treatment.

There is a practice, unfortunately too common, but which, I think, is every day becoming less common—namely, that of following an attack of apoplexy by depletive measures, very much as a matter of course. However applicable such a mode of treatment may be to strong, young, hale, and plethoric subjects, I presume no one will say that it is very well adapted to patients who have passed the meridian of life, and whose blood and whose tissues are more or less contaminated by gouty matters, and with whom a morbid state of the arteries of the brain has already greatly weakened the nutrition of that organ. The case, indeed, which I have just detailed to you, is one of many which proclaim loudly that a depletory system ought not to be pursued indiscriminately, or even generally, in apoplectic cases.

With reference to this question of depletion in apoplexy, I would refer you to an interesting and very useful work by Mr. Copeman, in which he has collected, from a great variety of sources, a large number of cases which presented the symptoms of apoplexy. Of 155 cases in which the treatment was specified, 129 were bled, and only 26 were not. Of the 129 who were bled 51 recovered, and 78 died—the cures being 1 in 2½, the deaths 1 in 1⅔. Of the 26 who were not bled 18 were cured, and 8 died, the proportion of cures being 1 in 1½, and of deaths 1 in 3¼. Eighty-five of the cases were bled generally and copiously, and of these only 28 recovered, and 57 died—in other words, two in every three cases terminated fatally. I am quite aware that the small number of cases not bled casts some doubt on the validity of the conclusion to be drawn from the comparison of the results of the treatment. But the fact that considerably more than half of those treated on the antiphlogistic plan died (and we owe much to the industry of Mr. Copeman for bringing it out), is a highly significant one, and should arrest attention.

[Dr. Todd adds the treatment of patients with apoplectic symptoms should not be regarded as a matter of routine; and that, however much popular opinion may be opposed to it, we must by no means rashly adopt the usual heroic practice of opening a vein upon the spot. Having placed the patient in a proper position, he says, we should direct our attention to the state of the stomach and bowels; and as these are often overloaded, we may clear them out by an active purgative administered by the mouth, or by stimulating and purgative enemata. Dr. Todd concludes:]

On the whole, then, I think that the results of experience denote that the majority of cases of apoplexy are best treated by purging, shaving the head and keeping it cool—perhaps blistering, and that bleeding is rarely applicable, except to the young, vigorous, strong, and plethoric.—*Med. Gazette, Nov.* 8, 1850, *p.* 779.

163.—STRUCTURE OF THE MEMBRANA TYMPANI IN THE HUMAN EAR.

By Joseph Toynbee, Esq., F. R. S.

In this paper, the membrana tympani is described as consisting of the following layers, which are quite distinct from each other, both as regards their structure and functions:—

1. Epidermis. 2. The proper fibrous layer, composed of—*a*. The lamina of radiating fibres.—*b*. The lamina of circular fibres. 3. Mucous membrane.

One of the principal objects of the paper is to describe the structure and functions of the fibrous laminæ. Since the time of Sir Edward Home, who pronounced the layer of radiating fibres to be muscular, anatomists have differed in their views of the nature of the fibrous element of the membrani tympani. The lamina of radiating fibres, the outer surface of which is covered by the epidermis, is described as continuous with the periosteum of the external meatus. With the exception of the uppermost fibres, which, on account of their being somewhat flaccid, have been considered as a separate tissue, under the name of "membrana flaccida," the radiate layer is composed of fibres, which extend from the circular cartilaginous ring to the malleus, and they interlace in their course. These fibres are from 4000 to 5000 parts of an inch in breadth.

The lamina of circular fibres consists of circular fibres, which are firm and strong towards the circumference, but very attenuated towards the centre. These fibres are so attached and arranged as to form a layer of membrane, which, in a quiescent state, is saucer-shaped.

The fibres composing the circular, are smaller than those of the radiate lamina, being from 6000 to 10,000 parts of an inch in breadth.

The facts that appear to be adverse to the idea of the fibres of either layer being muscular, are—1st. The absence of distinct nuclei in the fibres. 2d. Their great denseness and hardness.

It is next shown that the four laminæ forming the membrana tympani are continuous with the other structures, of which they appear to be mere modifications, and that not one is proper to the organ.

The tensor tympani ligament, which had not been previously noticed by anatomists, is particularly described; it is attached externally to the malleus close to the insertion of the tensor tympani muscle, and internally to the cochleariform process.

The latter part of the paper is occupied by observations on the functions of the fibrous laminæ, and of the tensor ligament of the membrana tympani, and it is shown that by these two antagonistic forces, the one tending to draw the membrana tympani inwards, the other outwards, this organ is maintained in a state of moderate tension, and is always in a condition to receive ordinary sonorous undulations.—*Lancet, July* 27, 1850, *p.* 131.

164.—NEW SPECULUM AURIS.

By J. Cooper Forster, Esq., M. B.

[Although Mr. Forster considers the small conical tube recommended by Mr. Wilde, of Dublin, a most useful instrument in ordinary cases as a speculum auris, yet, when the canal is deep, sufficient light cannot be thrown by it on the membrana tympani; and to obviate this inconvenience he has added to Mr. Wilde's instrument three-eighths to half an inch of silver tubing, of the diameter of the small end of the cone, by which he says, the membrane is more clearly seen, and any changes in the deeper portion of the canal more easily recognised.]—*Lancet, Aug.* 3, 1850, *p.* 148.

165.—DIFFUSE OPACITY OF THE CORNEA RESULTING FROM CORNEITIS TREATED BY STIMULANTS.

By Dr. Jacob.

From the variety of stimulants used from time immemorial to remove opacities of the cornea, and the number of them extolled as infallible, it may be presumed that any stimulant will answer the purpose. Solutions of nitrate of silver, sulphate of copper, sulphate of zinc, or the combination called *lapis divinus*, will perhaps answer. I use a solution of iodide of potassium, ten grains to the ounce of water; or, as a substitute for animal bile, said to be effectual, touch the surface with the camel-hair pencil previously dipped in water and brushed two or three times on soap. The fumes of prussic acid, so much vaunted as a quack remedy, I have not used, being dangerous and troublesome. If this nostrum has any influence at all, it is as any other stimulant.—*British and Foreign Med. Chirurg. Review, July,* 1850, *p.* 106.

166.—MUSCÆ VOLITANTES.

Brewster has founded, on experiments with his own eye, a view respecting the *muscæ volitantes*, which differs from the explanations given by De la Hire, Porterfield, and Mackenzie. He points out as the cause, portions of the cells in which the vitreous humour is inclosed, of which the torn filaments float about in the chamber, and throw shadow and reflected light on the retina. By means of two bright lights placed before the eye, two shadows of the same fibre were obtained, by the aid of which Brewster has measured the apparent diameter of the *muscæ volitantes*, as well as the distance from the retina of the bodies producing it. According to Brewster, the muscæ occur in every healthy eye, becoming dangerous only by too great an accumulation; they are, therefore, by no means a symptom of approaching blindness from cataract or amaurosis.—*Phil. Mag.*—*Brit. and For. Med. Chirurg. Review, July,* 1850, *p.* 250.

167.—CASE OF ENTROPIUM AND TRICHIASIS.

By H. Haynes Walton, Esq., F. R. S.

[This was the case of a female, æt. 40, who had had these diseases three years. Some of the ciliæ had been removed; but as her state was becoming more distressing, she applied to the hospital. Mr. Walton says:]

I operated for the entropium, and removed rather more skin than was sufficient to restore the lids to their natural position, and everted them a little, to get the lashes out of the reach of the cornea. In the right eye the intention was answered, but, in the left, a bundle of cilia, that passed from the centre of the lid, still encroached on the globe. Some weeks after, I removed them in this manner. I placed the tip of the fore finger under the lid, to raise it and render it firm, and also to protect the globe; then I made three incisions through the skin and orbicular muscle, down to the cartilage, one on each side of the cilia and a third above them, and seizing the little trilateral piece dissected it off, taking care to keep the edge of the knife close to the cartilage that the roots of the cilia should not be cut across, for, unless they are entirely removed, the operation would not be effectual. The operation may be done in other ways,—and I will show how when I come to speak of trichiasis alone. After the incisions have been made it is not absolutely necessary that the lid be supported by anything placed under it, but perhaps it is better that it should be, and, as the fore-finger is required for the use of the forceps, the third finger must take its place.—*Med. Times, August* 10, 1850, *p*. 137.

168.—MEDICAL JURISPRUDENCE OF INSANITY.

By Dr. Robert Jameson.

A careful distinction, says Dr. Jameson, must be made between *diseases having mental symptoms*, and diseases of the mind; betwixt madness, and such affections as hypochondriasis and hysteria. Hypochondriasis consists of illusions and hallucinations regarding one's bodily sensations, and is therefore not insanity, until these become deep-seated and permanent delusions, compelling to irrational conduct. Hysteria, hypochondriasis, and various other affections, which often precede, cause, and accompany insanity, are not diseases of the mind, but more strictly speaking, diseases having mental symptoms, until by generating delusions they pass into insanity, and afterwards continue as complications of the disorder which they have created. Thus we have hysterical mania, which is not hysteria merely, but hysteria and mania combined; so also there is hypochondriacal monomania, which is not hypochondriasis alone, but hypochondriasis and insanity together.

Simple defect of intellectual power, *intellectual dullness*, must not be confounded with the imbecility which constitutes a variety of insanity, which is not merely a feeble intensity of mind, but a positive deficiency of faculties. Wherever there is a feeble exercise of attention, or defective memory, there will be imperfect comparison, and resulting inaccuracy of judgment; but not from these, or similar causes, any necessary tendency to be governed by delusions. In all cases of imbecility included in the term unsoundness of mind, there are both emotional and intellectual deficiency, a loss of control over conduct, and from the antecedence of judgment being in some part defective or diseased, a liability to confound the actual with the unreal. Delusion is not a prominent characteristic, however, for in such cases feebleness is the type of all the mental manifestations, whether healthy or disordered.

Eccentricity has also to be distinguished from insanity. All the insane are eccentric in their ideas, their language, or their conduct, but the merely eccentric have but a voluntary resemblance to the insane. Eccentricities differ from lunacies in not arising from a loss, but from an undue exercise, of the faculty of judgment; very often from a vanity or self-respect in the individual, that leads him to prefer his own judgment to all other judgment, experience, and authority. They offend against custom and experience more than against reason. The eccentric, if he cannot give a satisfactory reason for his *outre* conduct, can at least assign an intelligible motive: the lunatic has no explanation to afford that does not involve an absurdity. A certain individual behaves in all respects like other men, unless that he constantly walks about without a hat, or any other artificial covering for his head. When questioned upon this point of disagreement with the custom of his neighbours, he says that nature did not intend the head to have any other protection than what she herself had afforded, that a bare head is more becoming, that he feels himself in every way more comfortable as he is, and that he is certain that he will live longer in consequence of acting in this rational way. In two instances in which lunatics adopted the same habit, the causes assigned by them were of a very different description. One did not have his head covered, because it had grown so large that he could not get a cap to fit it; and the other was so annoyed by certain mischievous tormenters of an invisible kind drumming upon the crown of his hat, that in general he preferred to carry it in his hand. The eccentric man had a rule of conduct, the result of his own narrow judgment; the two lunatics were impelled by fancies upon which their judgment was entirely inoperative. Lord Monboddo, insisting that the human family were originally adorned with tails, showed himself an eccentric theorist: had he asserted that they actually retained them, he would have had an insane delusion, instead of a philosophic crotchet. He would have had a false perception on which his judgment was inoperative, whereas he was guided *by his judgment* to a strange conclusion.

Eccentricities no more constitute insanity, than idiosyncracies constitute disease; and as these are competent with a sound state of body, so are those with even a vigorous judgment. For example:—there was an old man well known in London in the last century, who was of an ungainly appearance, and subject to occasional attacks of hereditary melancholy. So inconsistent was he in his habits, that sometimes he practised great abstemiousness, and at other times devoured huge meals, with brutish slovenliness and voracity: sometimes he would persist in drinking nothing stronger than water, but occasionally he drank wine by tumblerfuls. His income was far from large, and not of a certain amount, yet he kept a set of old men and women about his house, whose bickerings and disagreements now and then drove him out of doors. He was in general very loquacious, but had been known to sit in company and drink a dozen cups of tea, without speaking a syllable. When not engaged discoursing, it was his custom to keep muttering to himself. In walking he performed strange gesticulations with his limbs, and would not go in at a door, unless he could effect his entry in a certain preconceived number of steps, and so as to introduce himself on a particular foot, turning back, and recommencing, until he succeeded as he desired. There was a row of posts near his house which he would not pass without touching singly, and if he found that he had omitted one in the series, he retraced his steps to remedy the neglect. He hoarded up orange-skins for some mysterious purpose which he would never divulge. He suffered remorse of conscience for once having taken milk with his coffee on Good Friday. He believed in ghosts, and went ghost-hunting in Cock-lane; and he maintained that he had heard his mother calling upon him by name from the other world. Yet Dr. Johnson was so far from insane, that his judgment commanded respect and admiration everywhere, and by the common consent of eminent contemporaries he was the most vigorous thinker and the greatest sage of his time.

There are, however, instances of eccentric conduct resulting from *abuse of the imagination*, which verge closely upon madness, and occasionally pass into it. The distinction is, that the individual's voluntary power over his thoughts is capable of bringing the comparing faculty into efficient operation, when he chooses duly to exert his will. Thomas Hood speaks of one who, in consequence of exciting his fancy by German tales of diablerie, used to fly up stairs at his utmost speed from the street door to the attics, because a sort of wager with the devil came into his head, that he would gain the top before counting a certain number, or forfeit eternal happiness. Every one possibly experiences moods which differ in no respect from insanity, than that they are neither permanent nor independent of the will. These may be common in imaginative minds, but instead of being indulged, they should be guarded against and restrained, for, though they exist at first by sufferance of the will, they sometimes gain a strength that defies control, and triumphs over the reason. Hoffman, a master in fantastic fiction, suffered so much from intemperate abuse of the imaginative faculty, that solitude became terrible to him. He was never quit of a mysterious sense of danger; things the most cheerful became incongruously associated with thoughts the most dreadful, while monsters and spectres, which he himself had created, tyrannized over his reason. To appease his terrors, he had frequently to summon his wife from bed to sit by him as he studied at night. He was constantly on the verge of insanity, and died of spinal disease, his mind being tortured by his fancy to the last hour of his existence.

Often it is not an easy matter to draw a distinction between insanity and *moral depravity*. In every case of mental alienation there is disorder of moral as well as of intellectual manifestations. The moral disturbance is usually the earliest developed feature of the malady, frequently it is the most prominent and occasionally no other is distinguished; so that the bad have been liable to pass as mad, and the mad for bad, according to the philosophy and fashion of the time. There is no problem in law, medicine, and ethics, of greater social importance, or of more difficult solution, than the discrimination of insanity and vice. A wicked deed may be the result of an undeveloped moral sense, as for example in a child or an idiot; it may be the consequence of such extremity of passion as impels to instinctive, instead of deliberative action; and it may be the indication of a conscience enfeebled by voluntary neglect, and the habitual gratification of evil desires. Any of these states may be simulated by disease; but it is with the two last only that the jurist will have difficulty; for in all cases of insanity in which the moral sense is non-existent, the powers of the understanding also are either undeveloped or destroyed. No hideousness of depravity can amount to proof of insanity, unsupported by evidence of a judgment incapacitated, or a will fettered, by disease. In those cases of mental disorder in which the emotions are perverted, and where there is no clear proof of deranged intellect, cases which do from time to time occur, the presumption of insanity, in regard to a criminal action, has to be upheld by evidence of suspension of the will. The actions of an individual in such a state ought to be impulsive, involuntary, and irreconcileable with the idea of a healthy state of the emotional faculties.—*Medical Gazette, Aug.* 2, 1850, *p.* 179.

A SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOREGOING PAGES OF THIS VOLUME; AND SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

DISEASES AFFECTING THE SYSTEM GENERALLY.

Cancer.—Dr. Bennett has remarked that "in a cancerous growth, the tendency is to excessive cell-formation. We evidently retard its advancement by the application of cold. Were it possible, indeed, to bring down the temperature of an entire growth below the vegetating point, we must inevitably kill it; but supplied as it is through the warm blood within, this is impossible." The practice of congealing the parts as a cure for cancer has been attended with great success. Five minutes is the usual time to apply the congealing agent to the exterior of the body, when the skin and subjacent tissues are in their normal state: but it may be applied for fifteen or twenty minutes in the case of uterine cancer, and probably not with half the effect as when it is applied to the exterior, on account of the higher vascularity and natural heat of the part subjected to it. Congelation may be locally effected by mixing quickly half a pound of ice with half that quantity of common salt. This may be poured into a net of the thinnest silk gauze, and immediately applied to the part. The brine, as it trickles from the net, may be absorbed by a moist sponge." (Dr. J. Arnott, p. 28.)

[For a peculiar apparatus for applying this mixture to the os and cervix uteri, see p. 29.]

Fever.—*Hay Fever.*—Let ten drops of the tincture of the nux vomica of the Dublin Pharmacopœia, be taken for a dose, in water, and increased gradually to twenty drops, three times a day. It is an agreeable light bitter, increases the appetite, and influences the Schneiderian membrane, no doubt through the nerves. An ointment may also be applied as high up in the nostrils as possible, composed of ʒiss. of Goulard's extract, ℥ij. spermaceti cerate, and a few drops of oil of roses, or of bergamot. (Mr. G. T. Gream, p. 21.)

Intermittent.—M. Baud has discovered a new salt "hydroferro-cyanide of potash and urea" (!) which is stated to be far more efficacious than quinine in the treatment of all malarious diseases, and that the majority of cases in which quinine and arsenic had failed, were cured by it.—*Medical Times, Aug.* **24**, 1850, *p.* 210.

Rheumatic.—In a case of rheumatic fever in Charing-Cross Hospital, half an ounce of lemon-juice, given three times a day, was found very successful in removing the pains in the joints, after various other remedies had been tried. (Mr. Hancock, p. 37.)

Spotted Fever.—In the bloody diarrhœa of spotted fever, give two or three grain doses of gallic acid. (M. Homburger, p. 336.)

Scrofula.—Preparations of walnut-tree leaves have lately been introduced as a remedy for strumous disorders. The cases which have been treated with them have afforded some astonishing results. Out of fifty-six patients so treated, thirty-one were cured, and eighteen underwent great amendment; there being only four who obtained no advantage from the use of the medicine. Of the infusion sweetened with sugar, two or three cupfuls were prescribed daily. This is made by placing a good pinch of the leaves into 250 grammes of boiling water. The decoction for baths, lotions, or as injections in fistulous openings, is made by boiling a small handful of leaves for ten or fifteen minutes in a kilogramme of water. The extract is made by the method of displacement. The syrup is made by mingling forty centigrammes of the extract with thirty grammes of simple syrup. To young children, two or three teaspoonfuls of this syrup may be given in the course of twenty-four hours. The ordinary dose for adults is from thirty-two to forty grammes, and more than sixty-four grammes have been given. (Dr. Negrier, p. 32.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Coma.—Be careful, in the first instance, that the coma is not from pressure, or from inflammation of the brain, or dependent on opium or alcohol in the system. Besides these, the coma may be traumatic, epileptic, or renal epileptic, or hysterical, or rheumatic, or gouty. Always bear in mind, in cases of coma, to examine also the state of the renal and hepatic secretions; if these fail, coma is the result. As to the traumatic form, or that from concussion, the system of non-interference is the best. In the epileptic form also, the expectant plan, with moderate purging, answers better than any other. In the coma of gout, rheumatic or scarlet fever, the treatment must be of the eliminating kind, as blistering and purging, holding up at the same time the powers of the digestive organs. If there is reason to believe the blood is poisoned by urea, the hot-air bath is of service, giving also drastic purgatives, as elaterium, &c. At the same time, always remember, that as delirium is the slighter degree, and coma the more aggravated condition of the same state, the treatment of the two conditions must be similar. (Dr. R. B. Todd, p. 80.)

Catalepsy.—The most effective means are hot pediluvia, and the cold douche applied to the head at the same time. If sensibility remains, ammonia and other stimulants may be applied to the nostrils. Use also rubefacient frictions, and administer stimulating enemata. During the interval, the cause must be sought for, and, if possible, removed. If a hemorrhoidal hemorrhage has been suppressed, leeches must be applied round the anus; or if there are worms in the intestines, anthelmintics must be given. (Dr. E. Milner, p. 89.

Epilepsy.—Give one ounce of the recent expressed juice of the cotyledon umbilicus twice a day for some time; if this cannot be obtained, the concentrated fluid extract, prepared by Mr. Hooper, may be given; at the same time, use no fermented liquors, wear flannel next the skin, employ tepid sponging during the winter months, and cold sponging or the shower-bath in summer. (Mr. T. Salter, p. 84.)

Hysteria.—*Cerebral.*—Employ as a prophylactic and curative agent in this affection, the persevering and systematic application of electro-galvanism to the abdominal and pelvic regions, in combination with other means. Amongst the adjuvants that should be administered concurrently with its use, Dr. Laycock mentions tar in small doses, the introduction of which we owe to Professor Simpson, and which is in itself an excellent remedy for habitual constipation, without the aid of electro-galvanism. (Dr. Laycock, p. 82.)

Delirium —*Delirium e potu.*—The object here is to promote the elimination of the poison without depressing the vital powers unduly. This is best done by emetics, purgatives and sudorifics. Give the first if you have reason to believe alcohol or undigested food remains in the stomach. If the patient is violent, you may use mechanical restraint, applying, at the same time, cold to the head. Be very cautious in using blood-letting, on account of the great tendency to depression. If the stomach is highly irritable or inflamed, do not give antimony, but apply mustard cataplasms to the epigastrium. Give ice or iced water, cold drinks, and prussic acid. If these fail, then leech the epigastrium, give morphia and creosote, effervescing draughts with potash, soda, or ammonia, keeping up at the same time a free action of the bowels, by small and often-repeated doses of sulphate of magnesia, dissolved in water. In cases where the true delirium tremens is complicated with the delirium e potu, we must combine, as far as possible, the two forms of treatment. (p. 71.)

Of Bronchitis and Pneumonia.—Depression of the vital powers favours delirium. If delirium come on after antiphlogistic treatment, immedtately alter the plan, and adopt a stimulating one. There is great tendency to coma, especially after the antiphlogistic treatment. If coma come on. do not relax in giving support, and you may have to give stimulants. Apply also free counter-irritation to the back of the neck; and it may be necessary to shave the head, and apply a blister to the scalp. (p. 72.)

Of Epilepsy.—There are no direct means of cutting short the paroxysm of epileptic delirium. The more innocent means, as introducing salt into the mouth, and applying cold water, may be tried. The main treatment consists in a cautious guidance through the prolonged fits. There is no necessity for local or general bleeding. If the pulse is strong, no stimulants are required; if weak and irregular, or quick and running, then they are useful. The head may be shaved; and if hot, cold applied; and small blisters applied in succession to the scalp. All means must be taken to prevent the patient injuring himself, and the gentler these are the better. If there is extreme wakefulness, give hyosciamus or hop rather than opium; and the cold douche or shower-bath is often very effectual in inducing sleep. The other drugs which may be administered are of the tonic kind, the most useful being the metallic tonics. (p. 79.)

Of Erysipelas.—The treatment of this form of delirium involves the treatment of the disease itself. Erysipelas is dependent upon the introduction of a morbid poison attacking the skin, and proceeding to the gastro-pulmonary mucous membrane, or *vice versa*, inducing the secondary formation of abscesses or the tertiary chronic inflammation and induration of various glands, with the deposition of scrofulous matter. Can we eradicate this poison by a bold stroke at the outset? If a large dose has been imbibed, the disease must pass through a certain course; and as there are no means of extracting it, we must guide the patient through the various stages of the fever, and counteract its depressing and destructive effects. First evacuate the bowels, with as little depression as possible; then give nutritious food, with stimulants, as brandy or wine, giving them frequently and at short intervals, and adding ammonia, bark, &c., if deemed advisable. If the stomach is irritable, or the patient opposes, or is disgusted with the medicines, give up the drugs, and trust to food and brandy only.

When delirium sets in, the patient wants more support and more stimulus; and the more freely they are given, the sooner the delirium will be subdued. If there is a tendency to coma, shave the head, and apply blisters freely; and if the delirium is decidedly of the active kind, henbane, camphor, and hop are safer than opium, and may be cautiously given. (p. 73.)

Of Fever.—1st. Of the low muttering kind, the patient apparently unconscious, but capable of being roused by loud speaking. 2d. Delirium of the active kind, patient being wakeful, talkative, and needing watching, or perhaps restraint. This generally comes on very suddenly, but the first generally very gradually. In the treatment of typhus fever itself always give nutritious food and stimulants early. As there is no inflammation present in the brain when delirium comes on in typhus fever, do not bleed even locally. True, there is congestion; but it is only part of the general tendency, and therefore stimulate the capillary circulation, so as to promote the flow of blood, which tends to stagnate in the fine blood vessels. Apply, therefore, several small blisters to several parts of the shaven scalp in succession: if there is not time to wait, apply a large one, cutting it into slips, so as to apply it to all parts of the scalp. If there are clear reasons for taking away blood, do it rapidly by expert cupping over the temples. Be very cautious in giving opium; but if the state of congestion is not obvious, and the powers not very low, one or two doses well-timed often do great good. In the delirium of this disease, stimulants are of the greatest benefit; and give them in larger and more frequent doses. The pulse serves as a useful guide: if it does not quicken, but improves in quality, under their use, especially if it diminishes in frequency, let them be continued. (p. 76.)

Of Rheumatism and Gout.—This delirium occurs more frequently after bleeding than otherwise. But if the delirium does come on, it must not be allowed to continue, although the cardiac disease is present also. Opium is equally applicable to both, and it must be given to procure sleep, as in traumatic delirium tremens. Apply a blister to the region of the heart, and promote a free discharge from the blistered surface; avoid any bleeding or depressing treatment until all the delirious signs have passed away. Supply the patient constantly with food and with stimulants. Do not fear lest this plan should increase the cardiac affection: it appears to be the most effectual plan to cause the termination of it to be in resolution. If the antiphlogistic plan is persisted in, the delirium is increased, the powers of the patient exhausted, and effusion into the pericardial sac takes place. The delirium of acute gout needs the same treatment; but as it has a greater tendency to pass into coma, we must not be so ready to administer opium, but wait to observe whether there is any marked tendency to coma. (p. 72.)

DELIRIUM TREMENS.—1*st. Milder form.*—The great object of treatment is to restore the balance of nutrition, and procure sleep; hence regulate the diet, and give half a grain of morphia every night. As there is no inflammation to subdue, there is no need of the antiphlogistic treatment. 2. *More intense form.*—It is important to determine the cause of the disturbed nutrition, and administer the food in small quantities at a time, but frequently repeated. If the stomach will not bear solid food, or animal broths, milk may be given, combined with lime-water, or some alcoholic stimulant. To allay the irritability of the stomach, open the bowels by purgatives or enemata. Give ammonia in effervescence, or the common effervescing draught of soda or potash, or prussic acid or creosote, combined with morphia, or small quantities of iced water or ice; or apply counter-irritation over the region of the stomach. As to the means of restraint, let him be carefully watched, and persuasion used, rather than the employment of the straight-waistcoat; or call in the aid of some friend who is known to possess a powerful influence over him. To procure sleep, use crude opium or laudanum: give it, especially where there is much depression, boldly in two or three grain doses, with one or two grains of quinine. If the pupil becomes contracted, and yet he does not sleep, you may try chloroform. As a quieting means, the application of cold to the head, either by a bladder of ice, or the cold douche, may be tried, but they must not be applied too long. If you use chloroform, keep the patient horizontal; if the pulse fails or alters, desist, and always examine the heart previously. If the patient will not take food, it is very unfavourable: in this case, give enemata of some highly nutritious broth, such as strong beef-tea. If this fails, give food by the stomach-pump and œsophagus tube. In this disease do not bleed, unless there is a constant fixed pain in the head, which does not yield to the treatment, then you may bleed locally, but chiefly apply blisters or other counter-irritants. There is no occasion to give mercurials. If there is a tendency to coma, give up opium, and examine the urine if albumen be found it. The coma may be depending on the slow elimination of the urea. Apply blisters in this case to the back of the neck or head, and keep them discharging; at the same time promote the action of the skin and bowels as much as the strength permits. (Dr. R. B. Todd, p. 66.)

NEURALGIA.—The "Journal de Pharmacie" recommends sixty drops of chloroform to be rubbed up with one ounce of hog's lard, and two or three frictions a day applied over the painful spot. It should be kept from the light and air. (p. 85.)

POISONING *by Strychnine.*—A case in which all the symptoms of poisoning by strychnine were present, was very successfully treated by the inhalation of chloroform. (Dr. Munson, p 329.)

SCIATICA.—The French journals have recorded cases of the cure of sciatica by cauterising the ear on the anterior part of the right helix, and it would appear, from their statements, that the practice was of considerable antiquity. (p. 86.)

TETANUS.—We are justified, with the view of removing the exciting cause, in amputating the entire part, or dividing the nerves leading to it. In tetanus the energies of the brain are *minus*, and those of the spinal marrow *plus*; therefore we must increase the first by stimulants, wine, brandy, and Indian hemp, and reduce the latter by the careful use of tobacco enemata and fomentations (fifteen grs. of tobacco to eight ounces of boiling water) every half hour, so as to keep up a state of nausea. The spine should also be well rubbed with a liniment of croton oil and turpentine. It is right to say that idiosyncracy in some instances renders the use of tobacco extremely dangerous. The symptoms in this case, are, the countenance assuming a deadly hue and ghastly appearance, and the pulse becoming quivering and intermittent. When these occur the administration should be stopped, and stimulants immediately resorted to. These means, with paying attention to the state of the bowels by croton oil or other strong purgative, and bringing the patient under the influence of tobacco, as rapidly as possible, are the principal means upon which we have to rely. (Mr. H. R. de Ricci, p. 88.)

Traumatic.—Use frictions with the tincture of belladonna, composed of five parts of extract to eleven of alcohol, and apply them all over the body, more particularly over the rigid parts. (M. Bresse, p. 90.)

AFFECTIONS OF THE CIRCULATORY ORGANS.

ANGINA PECTORIS.—In addition to the remedies of books, special attention must be given to the inhalation of oxygen, and to the use of electricity. (Dr. Kneeland, p. 123.)

HEART.—*Disease of, and Dropsy following.*—In warding off the symptoms or feelings, too often concomitant with disease of the heart,—next to quietness of mind and body, equable temperature, and moderate or rather low living,—there is nothing equals the use of small doses of colchicum wine, weak saline purges, and inserting a seton over the region of the heart. In a sudden paroxysm of violent dsypnœa with feelings of immediate suffocation, no means are equal to abstracting from two to four ounces of blood from the arm. In the treatment of cardiac dropsy, the following diuretic, which will pump the patient out, so to speak, sometimes in a few hours, is recommended, and it is often of equal value in repeated attacks of the anasarca. ℞. Infusi digitalis, ℥iv; potassæ acetat., ʒij; sp. æth. nitrosi, ʒij; aquæ cassiæ, ℥iss. Capiat cochleare magnum quartâ quâque horâ. If these remedies (diuretics) fail, we must fall back upon purgatives, elaterium chiefly:—℞. Elaterii, gr. j; extracti coloc. comp. ℈iiss; extracti hyosciami, gr. xij. M. Divide in pilulas xij. Capiat unam nocte maneque. The combination of tartrate of potass, or the tartrate of potass and soda with the infusion of senna, is highly efficient. Puncturing the extremities and thereby draining off the fluid, should not be had recourse to until all internal remedies had failed; though whether as a palliative or as a hope of cure, it deserves more notice than it commonly gets. Although fomentations are more generally advised, yet the evaporating lotion has been found very successful in keeping down any disposition in the part to erysipelas. (Dr. A. Kilgour, p. 98.)

Fatty degeneration of.—As we cannot restore muscular fibres that have been destroyed, we can only hope to arrest or suspend for a time the progress of the disease by improving the quality of the blood, and thus supporting the vigour of those portions of the heart still uninjured. We must pay attention, in the first place, to the digestive organs, give bitter tonics and alkalies, and subsequently iron in different forms, and carefully regulate the habits of life. For the pain and the distressing attacks of angina pectoris, the greatest relief followed the repeated application of three or four leeches, succeeded by a blister, and after these the internal use of iron. Be careful in recommending exercise. Narcotics are given with great risk, but it is almost needless to indicate the usefulness of antispasmodic remedies during the paroxysmal attacks. (Dr. R. Quain, p. 93.)

Hemorrhage.—*From Leech-bites.*—This may be arrested by the application of caustic. To apply this properly, crush a small piece of lunar caustic to powder, heat the point of a silver probe in a candle, and dip it into the powder; it thus becomes crusted over with the nitrate, and forms a fine button of caustic, which will easily reach the bottom of any such wound. (Dr. D. Maclagan, p. 347.)

From Punctured Wounds.—Apply caustic in the manner recommended by Dr. Maclagan. See "*Hemorrhage from Leech-bites.*"

From Wounds of the Palmar Arch.—Flex the arm on the forearm at an acute angle, and retain it there either until the proper means can be used for securing the vessels, or until the wound has entirely healed. (Mr. E. Durwell, p. 212.)

Purpura Hemorrhagica.—Although purpura is certainly a disease connected with a dissolved and thin condition of the blood, yet it is also more than probable, that weakness of the vessels themselves, from defective nutrition of their walls, has a still larger share in the result; the symmetrical distribution of the ecchymoses, proving the correctness of this supposition. On this ground, the very valuable properties of turpentine as a styptic, both applied locally and administered internally, is strongly recommended, great benefit having been produced by it, when all other measures had failed. Twenty minims of the oil may be given in emulsion every six hours. A similar testimony of the styptic properties of turpentine is quoted from the illustrious Hunter, and also from Mr. Vincent, late surgeon to St. Bartholomew's Hospital. (Dr. W. Budd, p. 118.)

AFFECTIONS OF THE RESPIRATORY ORGANS.

Angina Tonsillaris.—Dr. Plange states that the employment of the zincum aceticum in this disease, and especially in thirty cases occurring during an epidemic of scarlatina, where it was exhibited in very different degrees of the affection, has been followed by almost immediate relief. He prescribes from ℈j. to ʒj. in from ℥vi. to ℥viij. of water, giving a tablespoonful in some mucilage every two hours, in severe cases, and frequently gargling the throat also with the same.—*Med. Times, August* 10, 1850, *p.* 150.

Asthma.—Give very minute doses of tartar emetic (from three to six pills, each containing 1-25th of a grain of tartar emetic every twenty-four hours.) (M. Bernardeau, p. 146.)

Diphtherite.—Apply the solution of caustic freely over the whole surface; the inflammatory crust is destroyed, and a more healthy surface remains. The repetition of the application two or three times a day is required. In scarlatina anginosa the same may be employed with good effect. The solution may be made of from 40 to 60 grains of crystallized nitrate of silver to ℥j. of distilled water. (Dr. Green.)—*Monthly Journal of Med. Science, July*, 1850, *p.* 15.

HEMOPTYSIS.—*Tubercular*.—An excellent remedy is gallic acid, in doses of two or three grains. (M. Homburger, p. 336.)

LARYNGO TRACHEITIS.—[Dr. James Gillespie records a case of this disease, in which the operation of tracheotomy was resorted to as a last resource, and with perfect success.] (p. 151.)

LARYNX.—The structural changes of the larynx are,—inflammation, which may terminate in ulceration, hypertrophy, induration, or deposition of tuberculous matter in the follicles themselves. This, from its frequency among the clergy in America is known as the clergyman's sore throat. Cauterize freely the whole diseased surfaces with a strong solution of crystallized nitrate of silver, consisting of from 40 to 60 grains to ℥j. of distilled water. The tongue is depressed, and the epiglottis brought into view by means of a jointed spatula. A sponge attached to a curved rod of whalebone is carried steadily, without touching the pharynx, behind the erect epiglottis, drawn slightly forwards and pressed steadily downwards, when it readily slips into the glottis, which is known both by the feeling of gasping, and the spasm immediately induced in the patient. By causing the patient to respire fully the operation is facilitated. It may be necessary to pass it fairly into the aperture, and down to the chordæ vocales, which is in general accomplished with little difficulty. Dr. Scott, who has repeatedly followed this practice, has never seen it produce any disagreeable symptoms. (Dr. Green, p. 147.)

[We think, however, that this practice of passing the sponge into the larynx must be attended with danger.—ED. RETROSPECT.]

PHTHISIS.—Tartar emetic has been used with excellent effect in this disease. Give from three to six pills in the 24 hours, each containing 1-25th of a grain. By their use the cough, dyspnœa, and inordinate action of the heart become calmed, and, in fact, all the good effects of morphia, without its inconveniences, seem to be produced. (M. Bernardeau, p. 145.)

STETHOMETER.—[An instrument for measuring the capacity of the movements of the chest has lately been introduced by Dr. R. Quain, which he calls the "Stethometer." A full description of this instrument is given at page 157.]

TRACHEA.—To apply nitrate of silver to the trachea, use an instrument having a small grindstone, five or six inches in diameter, which, being caused to be rapidly revolved by means of a pulley and strap, and the salt being placed upon it, a fine dust is thrown from it, which, by the mouth being opened and the breath drawn in, is placed in direct contact with the diseased surface of the trachea or larynx. (Dr. J. Chew Thomas, p. 150.)

AFFECTIONS OF THE DIGESTIVE ORGANS.

ASCITES.—At the suggestion of a French journal, it has been found that after all other means have failed, the application of diuretics locally remove the fluid of ascites. A mixture of equal parts of tincture of digitalis, tincture of squill, and tincture of soap, was rubbed freely and diligently into the skin of the belly, morning and evening. A copious flow of urine soon took place, and in 14 days the ascites had entirely disappeared. In another case, where the liniment could not be used, Dr. Duncan applied linen cloths soaked in the pharmaceutical infusion of digitalis, with perfect success. The infusion may be applied by means of the spongio-piline. (Dr. R. Christison, p. 120.)

Dr. Todd lays great stress on the success which has followed the treatment of numerous cases of ascites from pressure on the abdomen, by means of strapping and bandages. (p. 160.)

EPISTAXIS.—A tube of caoutchouc with a dilatable extremity, or balloon, has been invented by M. Gariel, which, by being introduced into the nostril and expanded by insufflation, exerts such pressure as to arrest the hemorrhage in cases of epistaxis. By being carried into the back part of the mouth along the floor of the nares, and then expanded, the posterior nares may be also plugged. M. Diday, of Lyons, has also made an ingenious use of a similar dilatable tube, by introducing it into the uterus, and expanding it, in repressing uterine hemorrhage. (p. 216.)

Hare-Lip.—The French surgeons operate on children a few days after birth; and it is stated that at that period they do not struggle, union is obtained very rapidly, the little creatures cry but little, take the breast well, and do not seem to suffer much. (p. 215.)

Hemorrhoids.—Administer two ounces of fresh linseed oil, morning and evening. The amendment is generally so rapid that the remedy is seldom continued longer than a week. The only precaution the while being the abstinence from alcoholic drinks and stimulating diet. (M. Van Ryn, p. 220.)

Hernia.—The following conclusions of a practical nature from attentively investigating the varieties of arterial distribution in relation to hernia have been arrived at by Dr. Redfern. In inguinal hernia divide the stricture upwards. The risk of hemorrhage is greater in operating for femoral than for inguinal hernia. Divide the stricture of a femoral hernia inwards, or upwards and inwards. Divide as few fibres as possible; avoid a sawing motion; and press the edge of the knife rather less on the anterior surface than directly on the edge of the fibres constituting the stricture. If the structure of the neck of the sac is divided upwards, the spermatic artery may be wounded, and the testicle lost. (p. 213.)

Liver, *Torpor of*.—The greatest possible difficulty meets us in the treatment of this state, occurring in those who return from tropical to temperate climates. What little bile is secreted being vitiated, our indications of treatment should be directed to the production of a more abundant and healthy action, and to the attenuation and elimination of the fluid secreted. Use the fluid extract of taraxacum, with the carbonates of soda and potash, or with the bitartrate of potash, which affects the excretion from the kidneys, increasing it in quantity, and modifying it in quality, while they exert a solvent power on viscid bile, on fatty and other animal substances, and correct the acidity of chyme. If the diuretic effect is wished to be increased, add the acetate of potash, or the benzoate of ammonia. If alkalies prove cold or ungrateful, substitute the dilute nitric and hydrochloric acids, especially where tropical dysentery or diarrhœa has previously existed, or where an irritable state of the mucous membrane is present. Aloes seems to be more valuable with the above combinations than any other purgative. If anæmia is present, restore the nutritive functions, if possible, and improve the state of the blood, by the alteratives already mentioned, bitter tonics, chalybeates, with mild aperients, and great attention to the diet and habits of life. If there is reason to believe that organic changes have taken place in the liver, or that it is accompanied with induration and enlargement of the spleen, use the nitro-muriatic acid bath, as it acts powefully in promoting the functions of the liver, kidneys, bowels, and skin. The nitro-muriatic acid, diluted, is made by mixing three parts of hydrochloric acid, two of nitric acid, and five of water; and of this dilute acid, three ounces to each gallon of water form a bath; two gallons will form a foot-bath; while the outside of the legs and thighs, the right side over the liver, and the inside of both arms, are sponged alternately. Let a dose of Epsom salts be taken in some bitter infusion every other morning, while the patient is in the bath. If there is dryness or harshness of the skin, use a vapour bath twice a week. If the bath is used for the whole body, excite gentle perspiration previously, by covering the patient with hot blankets. If it excites irritation of the skin, let the quantity of the acid be diminished. If irritation of the gums, with general malaise is produced, relinquish it for a time. This bath may be used for two months, or longer in the severer cases. The neglect of this invaluable remedy is very much to be regretted. It seems to be equally valuable in the secondary and tertiary forms of syphilis; and another valuable quality is, that the use of opium is not contra-indicated during its exhibition. We obtain from the use of these mineral acids all the remedial effects in chronic, which we do from mercury in acute diseases, without its injurious effects. (Mr. James Ranald Martin.)—*Lancet*, *June* 22, 1850, *p.* 749.

Prolapsus Ani.—Five different means of treating this affection are mentioned by M. Dieffenbach in his operative surgery. 1st. By diminishing the anal opening by excision of folds around it: 2nd. By excision of wedge-shaped pieces from the anus; 3rd. By excision of parts of the anal ring, and of the callous prolapsus; 4th. By extirpation of the spongy prolapsus; and 5thly. By cauterization. The respective merits of these different methods are fully discussed at page 218.

RECTUM.—*Fungous Tumour of.*—This affection in children, attended by bloody discharges, which M. Leclayse believes is often mistaken for hemorrhoids, M. Martin has repeatedly and successfully treated by the application of the nitrate of silver. (p. 218.)

Stricture of.—An operation for this disease was performed at St. Thomas's Hospital, as follows:—The patient being placed upon her face, the stricture soon reached, the mere point of the finger getting into it, a grooved director was passed up to it. together with a bistoury. The director was next let fall out, and the knife carried through all the parts up to the coccyx. The intestine above the point of the stricture seemed quite free. The rectum was laid open, and two vessels, probably branches of the superior hemorrhoidal, spouted out pretty freely, and were tied; the fibres of the upper and lower sphincter were also visible. The thick mucous membrane with the stricture, and the various veins and nerves were all divided. After the hemorrhage had ceased, a large plug of lint was put into the wound, and secured by a T bandage. The operation was quite successful. (Mr. J. Simon, p. 216.)

TONGUE.—*Inflammatory and other affections of.*—Dr. Fleming says, that sudden and alarming swelling sometimes takes place in the tongue, which seems to be merely an unaccountable and active hyperæmia, readily yielding before inflammation has had time to be lighted up, by incision, by leeching copiously, both locally and under the chin. Another affection is "an inflammation, circumscribed or diffused, originating in the loose cellular tissue between the genio-hyo-glossi muscles," the treatment for which is antiphlogistic, but if it does not readily yield, Dr. Fleming recommends a free incision to be made under the chin in the median line, through the integuments and fascia, and through the raphé of those muscles, delaying the advancement of the suppurating process. Dr. Fleming says, the best treatment for the abraded surface of the tongue, sometimes met with, and for a peculiar kind of ulcer, which is accompanied by a small tumour about the size of a pea, and which he states may occur without the slightest suspicion of a syphilitic taint, is the iodide of iron, with hemlock, and the local application of the nitrate of copper. Dr. Fleming thinks it a tuberculous disease, and says it is by no means uncommonly met with. The nitrate of copper, he says is almost invaluable also as an application to the small excoriated ulcers, of a semi-phagedenic character, occurring in the genitals of both male and female. It is very deliquescent, and can be applied only in its liquid state. The surface of the ulcer should be well dried previously, and afterwards covered with oil.—*Dublin Quarterly Journal, August*, 1850, *p.* 87.

TEETH.—*Vegetable and Animal Parasites of.*—From microscopic observations made by Dr. Bowditch, he has, in a large majority of instances, found these parasites between the teeth, or at the juncture of the gums, in persons from different classes of the community, but without any disease of the mouth. He attributes their presence to a want of cleanliness; and recommends thoroughly brushing the teeth after each meal. M. Foy, a French dentist, recommends tinct. kino, tinct. catechu, aa; a teaspoonful to be added to cold or tepid water, and used every morning.—*Brit. and For. Med. Chir. Rev., Oct.*, 1850, *p.* 554.

TONSIL.—*Enlarged.*—The excision of enlarged tonsils is recommended, as performed by M. Lisfranc, of Paris, by grasping the tonsil with the forceps, pulling it inwards from the side of the fauces, or merely held steady in its natural position, and then passing a straight narrow blunt-pointed bistoury, the blade being sheathed except rather more than an inch from the point, through its base. It may be done with perfect safety, with immediate relief, and with little hemorrhage succeeding. (Prof. Syme, p. 215.)

Mr. Harvey recommends the bichloride of mercury, in small and divided doses, with tincture of rhubarb and of bark, to be taken at bedtime; also the tincture of colchicum, to be taken internally, and applied externally with lin.

saponis. When the scrofulous character predominates, he uses the cod-liver oil. Of all the remedies advised to be used in the chronic state, Mr. Harvey thinks colchicum is the best. He was led to this conclusion from investigating the history of this affection, and the contents of the tonsils, resembling very much those concretions found in the joints of gouty and rheumatic patients.—*London Jour. of Medicine, Sept.*, 1850, *p.* 850.

WORMS.—*Tape-worm.*—Order the patients to live sparingly, and take a dose of castor oil the day previously, and then give a dose of kousso, giving also a dose of castor oil soon after it to carry it down to the worm, and expel the dead or enfeebled worm from the bowels. This medicine is prepared in separate doses by Mr. Hooper, Pall Mall, for 16s. to 20s. a dose.

[Dr. Inglis, of Halifax, has also recorded a perfectly successful case of expulsion of tape-worm by the administration of the kousso. (p. 166.)

AFFECTIONS OF THE URINARY ORGANS.

BLADDER, *Chronic Catarrh of.*—M. Ricord uses caustic injections, ʒij of nitrate of silver to ℥iv of distilled water. He repeats the injections every three, four, or six days. (Mr. W. Acton, p. 263.)

Paralysis of.—M. Lecluyse has published some cases in which all ordinary means appearing useless in removing this affection, he gave strychnia internally, but without any benefit to the paralysis. He then dissolved six grains in alcohol, mixed it with a pint of water, and ordered four injections of ℥ij. each to be introduced through the catheter, the bladder being previously emptied. It was followed by complete success. But in another case under M. Robert, this gentleman ordered three grains in six ounces of water. This not being soluble, the pupil in charge substituted the sulphate of strychnia for the alkali itself. The injection was given, but symptoms of poisoning soon came on, and the patient ultimately died from the effects of the strychnia upon the system. No appreciable change was remarked in the muscular coat of the bladder, it remained perfectly paralyzed. (p. 187.)

Great benefit will be found to result in this disease from the application of electricity as follows:—A silver catheter is introduced into the bladder, and a female catheter introduced into the rectum, and made to rest upon the recto-vesical parietes; each of these catheters is connected with one of the poles of an electric machine, which is put at first in gentle action, and then continued briskly for two or three minutes. (M. Michon, p. 188.)

HEMATURIA.—Give gallic acid in two or three grain doses. (Mr. Homburger, p. 336.)

PHYMOSIS.—M. Vidal operates for phymosis, by tracing with ink on the prepuce, a line indicating the point where the section is about to be made, then grasping the prepuce with a dressing forceps, in front of this line, he draws the prepuce a little forward, and having passed three needles with a waxed thread through it, at the line traced by the ink, he divides the mucous membrane and skin at one cut. (p. 237.)

RETENTION OF URINE.—Mr. Tatum, of St. George's Hospital, reports a case in which retention of urine had taken place from stricture. All means of passing the catheter both before and after the warm bath, and after the most patient and cautious manipulation in trying to accomplish this object had failed, and it was only after a large dose of laudanum had been twice given, and the warm bath repeated with a soothing enema, that the catheter could be introduced. The symptoms again coming on after some time, the same means were again repeated, but it was not before a purgative draught had been given, eight leeches applied to the perineum, and the opium and warm bath again resorted to, that the stricture yielded so as to allow the instrument to be passed, and the bladder to be emptied. (p. 234.)

Mr. Holt, of the Westminster Hospital, reports a similar case coming under his care, where the same means and the same perseverance were rewarded with success. (p. 230.)

When the bladder cannot be evacuated by the catheter, after leeching, aperients, warm baths, and opium, are we to puncture the urethra behind the strictured portion (Sir A. Cooper,)—or make a free opening in the perineum over the strictured part (Liston),—or perforate the bladder through the rectum? Mr. Gay, of the Royal Free Hospital, advocates the latter, and states that he has never met with one unfavourable result from the practice. (p. 232.)

A new method of relieving retention, without using the catheter, is as follows:—Clear out the intestines by an enema, then administer as an enema a quart of cold water. Absolute rest must be enforced, and apply bladders of ice, cold water, or pounded ice to the anus, perineum, thighs, and hypogastrium. If this does not succeed, let a stream of cold water be poured upon the region of the bladder during twenty to twenty-five minutes. After a time, repeat the cold applications as above. This mode is chiefly valuable where the retention proceeds from spasm, or acute inflammation. (M. J. J. Cazenave, p. 233.)

Stricture of the Urethra.—In three cases at Guy's Hospital, which, in spite of all ordinary dilating means, soon resumed their former strictured condition when these had been removed for a short time, the operation of perineal section was performed, as was recommended by Mr. Syme. In one, an extremely irritable and nervous subject, the issue was unfortunately fatal; but in the other two complete success resulted, and the patients passed their water without any difficulty. (Mr. Cock, p. 220.)

In three cases of stricture of the urethra operated upon by Dr. James Dunsmore, in the Royal Infirmary, Edinburgh, by external incision, as recommended by Mr. Syme, no conclusion could be drawn from the first case either for or against the operation; but in the other two the result was perfectly successful; and so satisfied is he of its advantages, that he intends adopting it for the future in all cases of bad stricture coming under his care. (p. 227.)

In ordinary cases, M. Ricord employs simple dilatation by means of conical gum-elastic bougies with a little olive-shaped point. When retraction takes place, the case is treated by incision with instruments passed down the urethra. (Mr. W. Acton, p. 264.)

AFFECTIONS OF THE SKIN, &c.

Abscesses.—In opening abscesses, if the attenuated skin is of a circular form, so that when divided by the knife in any direction, it must leave broad thin flaps, apply caustic round the edge where the healthy and thin skin meet; and the whole of the latter being, as it were, included in a ring of eschar, will perish. This plan answers well in large buboes, especially in scrofulous subjects. If the abscess has opened spontaneously, and there is much unhealthy skin, and also unhealthy granular and cellular tissue below it, use the caustic at once, as all this has to be got rid of before a cure can be accomplished. (p. 435.)

Contractile Cicatrix.—To close preternatural openings which have lost all tendency to contract naturally, if the openings are small, with callous edges, apply the nitrate of silver. If they are large, pare the edges, and bring them together by suture; and if a small opening should still remain, then the application of caustic may complete the cure. (Dr. D. Maclagan, p. 348.)

Eczema.—A remedy which has been found more extensively applicable and more uniformly serviceable than any other, is a solution of two drachms of the sesqui-carbonate of soda in a pint and a half of water; but it is necessary to place lint saturated with the solution over the affected part, and to cover the whole with oil-silk, in order to prevent evaporation. In these cases there is an increased exudation from the skin, both of sebaceous and purulent matters; and alkalies, we know, have the property of dissolving these, and of acting as a calmative and emollient to the irritated parts. (Prof. Bennett, p. 243.

Erysipelas.—Mr. Lawrence recommends the antiphlogistic treatment; Dr. Fordyce the stimulating plan; Desault gives a grain of tartar emetic in a considerable quantity of fluid in the bilious erysipelas. There is no form of the disease which should not be attacked from the first with tartar emetic, and under all and every circumstance we shall find that the disease yields to this remedy. It should be administered in small doses (one grain dissolved in any bland fluid being taken in the twenty-four hours,) which may be repeated three or four times, so as to keep up its effect on the disease, on which it appears to act as a specific. As a general rule when the erysipelatous surface is getting a yellow tinge, the skin shrivelling a little, and the pulse becoming more frequent (as it generally falls under the use of the tartar emetic,) the proper time has arrived to commence with tonics and omit the tartar emetic. Of these the sulphate of quina has been found the most successful. In some cases where there are low typhoid symptoms, with prostration of strength, tonics and stimulants may have to be given with the tartar emetic, even from the commencement. Pil. rhei co., gr. vj. with pil. hydrarg., gr. ij may be given as an aperient, to be repeated in six or eight hours if necessary. All local applications are unnecessary except in idiopathic erysipelas, in which flour or powdered starch may be used, and in the traumatic form, a large linseed-meal cataplasm. There is rarely any occasion for leeching, or the making of incisions, if the antimonial treatment be early adopted. Erysipelas being a constitutional disease, local treatment is of little use; "inflammation being the method taken to throw off the morbid state of the blood, anything that tends to check that eruption will be the means of preventing the efforts of nature, and probably cause a metastasis to some other part of the body."—(Dr. A. J. Walsh, p. 32.)

Apply collodion over the inflamed and neighbouring parts. It acts by compressing the capillaries of the skin, and thereby contributing materially in relieving those vessels. The results of this treatment have been highly satisfactory. (Mr. J. Luke, p. 259.)

Favus.—By those not well accustomed to the diagnosis of skin diseases, favus has often been confounded with other eruptions of the scalp, more especially eczema and impetigo, or the combination of these diseases known as the eczema impetiginodes; but in none of these do the yellow crusts or scales present, when examined microscopically, traces of vegetation. This furnishes the real diagnostic and pathognomonic character of the disease. There can be no doubt the disease is inoculable, and capable of being communicated by contagion. The pathology of favus is best understood by considering it essentially to be a form of anormal nutrition, with exudation of a matter analogous to, if not identical with, that of tubercle, which constitutes a soil for the germination of cryptogamic plants, the presence of which, as stated, is pathognomonic of the disease. As favus is in many cases a constitutional disease, and dependent upon the causes inducing scrofulous diseases in general, the treatment must be constitutional, and directed to remove the tendency to tubercular exudation. The internal and external exhibition of cod-liver oil with appropriate diet and exercise, has been attended by most marked advantage. As to the local treatment, Professor Bennett directs the affected scalp to be poulticed for several days, until the favus crusts are thoroughly softened and fall off, then the head to be carefully shaved, and lastly, cod-liver oil to be applied with a soft brush, night and morning, and the head covered with an oil-skin cap to prevent evaporation, and further exclude the atmospheric air. Every now and then the accumulated and inspissated oil should be removed by gently washing it with soap and water. Whenever favus is recent, and of limited extent, it may be at once destroyed by cauterization with nitrate of silver. (Dr. Bennett, p. 238.)

Lupus.—Dr. Thomson relied on three medicines—iron, iodine, and arsenic, with biniodide of mercury, and the occasional use of cod-liver oil and quinine. If the general health was at all lowered, and if there were any anæmic symptoms, cod-liver oil and iodide of iron were given for ten or fourteen days. After this, the alterative treatment was commenced, by giving the biniodide of arsenic in 1-12th of a grain. If gastrodynia came on, the medicine was left off, and opium and hydrocyanic acid administered. Conium was also found useful, and frequently mixed with the biniodide. If the latter could not be borne, then the liq. potassæ arsenitis was given in small doses, from four to eight minims, and iodine was rubbed in over the healthy skin to promote absorption.

Dr. T. occasionally applied the strong nitric acid to the edges of the ulcer, or a strong solution of the nitrate of silver (ʒij or ʒiij to ℥j of water) over the tubercle, and subsequently acetate of lead wash to lessen the temporary heat and swelling which followed. If unhealthy pale fungous granulations arose, an ointment of iodide of sulphur, or a very weak ointment of the biniodide of arsenic, or of either of the iodides of mercury, was employed. (Dr. Thomson, p. 255.)

Nævus.—[Mr. Fergusson treats this affection by strangulating it by a peculiar knot. For the method which he operates see page 322.

Psoriasis.—" Psoriasis, so called, lepra vulgaris, psoriasis diffusa, psoriasis gyrata, psoriasis guttata, and psoriasis inveterata, are one disease more or less chronic." The real nature of psoriasis is altogether unknown. There is no exudation, properly so called; there is considerable redness and an increased growth, or an hypertrophy of the epidermis. As there is generally a deranged state of the digestive organs, with sometimes constitutional disorder in this affection, we must correct these by suitable combinations. For the constitutional treatment, he advises equal parts of Fowler's solution and tincture of cantharides, in doses commencing with ten drops, gradually increased to fifteen or twenty. Most dermatologists are agreed that the best local application is the pitch ointment (ung. picis); if it causes considerable irritation it may be diluted with an equal part of lard. Some cases require only the arsenic, others the pitch ointment alone, and a third class of cases require the action of both. (Prof. Bennett, p. 244.)

And Lepra-Vulgaris.—Arsenical preparations, and especially Fowler's solution, are the best internal remedies. Tar takes the first place as an external application. The combination of these is the best treatment for psoriasis. The iodide of mercury ointment is occasionally useful when judiciously applied, and next to it the iodide of sulphur. The tar ointment is made by mixing a third or a fourth of a part of tar to two or three parts of axunge. The ointment of iodide of mercury is made by mixing one part of proto-iodide of mercury with eight of axunge; and that of the iodide of sulphur by mixing from one part in thirty-two to one part in eight of lard. Besides these, dietetical and hygienic measures must be adopted. Diet mild and not too substantial, avoiding all aliments difficult of digestion, regular exercise, frequent use of baths, and having recourse again to the treatment which had benefited them before, on the least appearance of the disease. (M. Emery, p. 245.)

Skin Diseases.—*Arsenic.*—The unfavourable states of the system to the administration of arsenic are,—1st. A febrile state, especially the sthenic form of pyrexia, indicated by the usual signs; 2d. A condition the very reverse of this febrile state is likewise unfavourable. 3d. A syphilitic taint. 4th. The existence of organic visceral disease, as a complication of eruptions, an attack of diarrhœa, bronchitis, cynanche, coryza, or severe irritation in any mucous membrane. Certain conditions of the nervous system, especially those connected with dyspepsia, and nearly all other disorders of the general system, generally contra-indicate the use of arsenic: but if the health can be restored by other means, it may afterwards be administered with advantage. Mr. Hunt also gives some cautions as to the mode of giving it. He says, as we wish it to enter the general circulation, it should be taken on a full stomach, as it then directly enters the circulation with the chyle, being absorbed by the lacteals; if it is taken on an empty stomach it would be chiefly absorbed by the venous capillaries, and enter the portal circulation. It should be taken after a meal, also, to obviate any irritation it might produce in the stomach and bowels. Again, as arsenic is a cumulative medicine, it should never be administered in increasing doses, otherwise a sudden and sometimes an alarming development of its toxical effects will necessitate an entire suspension of the medicine. The best plan is to begin with five minims of Fowler's solution three times a day, and continue the dose steadily until the conjunctiva or tarsi become slightly affected; then reduce the dose again and again, as the cumulative action becomes apparent in the state of the tarsi. (Mr. T. Hunt, p. 250.)

Medicated Soaps.—[Sir H. Marsh has recently brought into notice various medicated soaps, which he recommends in some chronic forms of skin disease, as chronic eczema, psoriasis, &c. At page 260 of this volume are given various formulæ, in which sulphur, white and red precipitate, and corrosive sublimate, may thus be applied, and Sir H. Marsh states that, after a little perseverance in their use, the effects were spoken of by the patients as being very soothing and beneficial.]

Tumours.—*Erectile in Children.*—A good method of treating these tumours, which consist essentially of a congeries of enlarged blood-vessels, is by caustic. Pass a red-hot surgical needle, which may be readily heated by a gas-flame, once or twice through the base of the tumour. The object is to cause effusion of lymph, and thus to alter the structure of the tumour, and arrest its growth. (Dr. D. Maclagan, p. 345.)

Ulcers.—*Of the Leg.*—In those cases "depending upon debility, with want of action in the system, circulation languid, wound sluggish, the surface smooth, without granulations, and of a greenish foul appearance. Mr. Hancock gives the following mixture—sp. terebinth. ʒ vj; pulv. acaciæ. ʒvj; aq. menth. pip. ℥viij. Cap. ℥j ter die, with a generous diet and a liberal allowance of wine, linseed meal poultices applied for a day or two, and then water dressing, with bandaging up to the knee throughout the case.—*Med. Times, July* 6, 1850, *p.* 12.

Varicose.—After all other measures have failed in the treatment of this affection, in cases at St. Thomas's Hospital, perfect success has followed the application of a caustic issue, by rubbing potasa fusa along the chief vein between the ulcer and the heart. (Dr. C. Kidd, p. 256.)

Warty Ulcers of Marjolin.—Chloride of zinc has been used in this disease, at the suggestion of Dr. Robert Smith, with remarkable success. On the first application the chloride was mixed with flour, but being too weak in this manner, it was mixed with two parts of pure sulphate of lime. The whole of the morbid growth was covered to the depth of a third of an inch with this paste. The severe pain it gave rise to was only partially under the control of opium. (Dr. Fearnside, p. 249.)

Wounds.—*Union of.*—M. Vidal has contrived a number of minute forceps of different shapes, whereby the lips of the wounds, especially after the operation for phymosis, being gently kept in opposition by their self-applying pressure, the use of sutures is rendered unnecessary, the pressure exerted not being so great as to perforate the skin. The period for their application does not exceed twenty-four hours. (M. Vidal, p. 259.)

Poisoned.—Having removed the poison as much as possible by suction, encouraging the part to bleed, or excision of the whole tract of the wound, apply caustic to the surface freely. Venereal chancre may be regarded as a poisoned wound, and according to Ricord and others, if it is cauterized during the first three or four days, constitutional symptoms never follow, as the surface secreting the poison is destroyed, and the virus is thus prevented getting into the system. (Dr. D. Maclagan, p. 345.)

AFFECTIONS OF THE BONES AND JOINTS, &c.

Anchylosis, *Peculiar mode of obtaining.*—In cases of diseased joints, attended by suppuration, and also in chronic diseases of the joints, namely, where destruction of the articulation has taken place, and nothing can be obtained (supposing amputation be not performed) but a stiff joint, the best plan, is that of freely opening the joint at once. In the first place, the consequences of opening diseased joints are not so serious as are usually represented, but, on the contrary, are so slight as scarcely to deserve notice; in the 2d, the process by which nature cures a joint in which the cartilages are removed by disease, is anchylosis, but this eventual result demands the absence of cartilage; and lastly, the articulation is placed in the condition of a sinus which has been slit up. (Mr. Gay, p. 197.)

Dislocation *of Lower Jaw.*—It is not on the condyle that we must fix attention to find the cause which renders the dislocation permanent, but on the coronoid process and the malar bone, since it is in the contact of these two bones that almost all the difficulty of reduction resides. And therefore to succeed, according to the process of M. Nélaton, it is necessary to act either by the interior of the mouth, taking a point of support behind the mastoid processes, or externally, by the operator taking a position behind the patient, and making pressure on the coronoid process, pushing it downwards and backwards, to disengage it from contact with the malar bone, at the same time the patient opens the mouth. This is effected by pressing in the direction mentioned, placing the thumb upon the coronoid processes. If this force is not sufficient, the head must be supported by an assistant; or a band may be passed around it, in which the operator can engage his index and middle fingers, while the thumb must be brought to bear on the coronoid process. (M. Nélaton. p. 209.)

Of Thumb.—An instrument in the shape of a pair of forceps, with a contrivance at the end by which the thumb can be grasped, has been devised by M. Luer, and modified by M. Charriere, and is said to be of great service in effecting the reduction. (M. Blandin, p. 211.)

FRACTURE *of the Leg.*—[Mr. Salter, late house-surgeon to King's College Hospital, has recently introduced a new swing apparatus for the treatment of fracture of the leg, and the use of which, he says, is attended by great benefit and immense comfort to the patient. This apparatus is fully described at page 206.

Of the Ribs.—Pass large strips of adhesive plaster round the top of the chest, down over the site of the injury to about midway between the last rib and crest of the ilium; enjoin absolute quiet (not a word to be spoken). The strapping carefully managed, and the administration of tartrate of antimony sedulously attended to—especially if perspiration break out—the rapidity with which these cases do well is quite wonderful. (Mr. Hilton, p. 205.)

Ununited.—This was effected by means of gradual extension being made by an instrument firmly grasping the thigh above the condyles of the femur, the foot below having a screw, by means of which the distance between the knee and foot could be gradually increased, the tendo-achillis being divided. During this time also steady continued pressure was kept up on the tibia above the fractured part, and counter-pressure on the opposite side of the limb. When the union was strong enough it was put up in common splints and well supported. (Mr. R. W. Tamplin, p. 204.)

JOINTS, *Chronic Disease of.*—In chronic diseases of the joints, connected with gout and rheumatic gout, much may be done to prevent its progress at its very commencement. Place the patient on a careful system of diet, partaking very moderately of animal food, avoiding fruit, acids, &c., and taking little or no fermented or spirituous liquors. Perspiration should be induced by exercise or by the hot-air bath, once in a week or fortnight. Acetic extract of colchicum, in alterrative doses, combined with mercurial pill, and occasional purgatives, should be given from time to time. Moderate doses of potash and magnesia (always avoiding soda) may be given three or four hours after the principal meals, to neutralize any superabundant acid in the stomach. If the patient is depressed by the colchicum, give Dr. Gregory's powder. Little is to be done locally. If pain is severe in the part, leeches may be applied, and, if need be, a bandage for the purpose of limiting motion. When the disease is fully established, these remedies may be still used to mitigate the symptoms, but we must then give the iodide of potash in two or three grain doses twice daily, and continue it for weeks, if it agrees with the patient. No general rule can be laid down. In one case great benefit was found from the use of cod-liver oil locally, and from its administration internally. (Sir B. Brodie, p. 192.)

Excision of the Knee-joint.—Although the operation performed by Mr. Fergusson, and described as follows, was unfortunately fatal, yet it deserves the earnest consideration of the profession, as it has in one instance, at least, been successful. Mr. Fergusson, made an H incision in front of the joint, the transverse line running a little below the patella. The extensor tendon was then directed upwards and raised with the patella, like a lid. The ligaments were then divided, the soft parts detached from around the bones, one inch and three quarters of the lower end of the femur, as well as the head of the tibia for about three quarters of an inch, were sawn off from before backwards, and the sharp margins of the bones pared down with the forceps. Mr. Fergusson then cut out the patella from its ligamentous attachment, several vessels were secured, and the lines of incision brought together by points of suture. Water-dressing and a roller were subsequently applied round the joint, and the patient removed to bed, where the leg was kept extended with a pillow under the ham. (p. 200.)

Hip-joint disease.—An opening having been made freely with an abscess-lancet, the limb may be wrapped up in a flannel, wrung out of hot water, and this may be continued until the first flow of matter has ceased, a poultice or water-dressing being applied afterwards. The opening should be free, so that the abscess should heal from the bottom; and also that no pressure need be used to cause it to escape. All rough manipulation is to be carefully avoided. The treatment of a sinus which is left after the opening of an abscess may be comprised in a few words. If the orifice be disposed to heal prematurely, it may be prevented by the occasional application of the caustic potash, care being taken that the caustic does not enter the sinus itself; otherwise some simple ointment, or water-dressing, is all that is required. The old practice of probing a sinus yields us no accurate information, nor is it useful: and the same remark applies, but with greater force, to the use of stimulating injections. (Sir B. Brodie, p. 189.)

Several cases of this disease have been successfully treated at St. Thomas's Hospital, by the use of cod-liver oil. It changes the abnormal molecular condition of the blood, so well known to exist in these cases, and so often connected with scrofula and other constitutional disorders. (Dr. C. Kidd, p. 195.)

Hydrarthrosis.—M. Velpeau says, in his opinion, there is not more danger in injecting a joint than in injecting the tunica vaginalis, and that he has done it with complete success, the smallest possible trocar being employed. Neither does the question of injecting the abdomen in ascites with iodine seem to him one of mere hypothesis. Many French surgeons have related numerous cases followed by complete success, where the practice has been employed, while others consider the conclusions drawn to be somewhat hasty. (p. 198.)

Talipes Varus.—[A new form of apparatus has been invented for extending the leg and foot after the operation for talipes varus, and is at present in use in the London Hospitals; it is described at p. 317.]

Tourniquet.—[A new tourniquet, invented by Mr. Skey, is described and figured at p. 321.]

VENEREAL AFFECTIONS.

Gonorrhœa.—Give acetate of potash in half drachm doses, every four hours. Even where the disease has not yielded, it has been repeatedly found, that, after a few doses of copaiba, the cure has been completed, and a relapse prevented. (Mr. J. Hilton, p. 264.)

The severe forms of gonorrhœa which are so exceedingly obstinate, are owing to the inflammation spreading along the entire canal, extending over to the mucous membrane of the bladder itself, nay, even, in some cases to the ureters and kidneys; and pus diffused through the urine is an indication of it. There is no specific remedy for this form, but when pus has once appeared in the urine, the antiphlogistic treatment must be more strictly enforced; and when the inflammatory symptoms have subsided, then, and not until, specific remedies, as balsams and cubebs, may be resorted to. (Mr. W. Colles, p. 265.)

Syphilis.—Surround the patient with an atmosphere of mercurial vapour, in a moist state, by the following method:—Place the patient on a chair, covering him with oil-cloth lined with flannel, then fumigate him with the bisulphuret of mercury, or the grey oxide, or binoxide. The patient may remain in this mercurial atmosphere for ten minutes or half an hour. Let the patient then repose in an arm-chair, for a short time, and let him drink a cup of warm decoction of guaiacum, sweetened with syrup of sarsaparilla. (Mr. Langston Parker, p. 261)

Indurated Chancre.—M. Ricord gives the proto-ioduret of mercury, but this does not seem to agree with patients in this country, which may be attributed to climate and difference in diet. He says mercury must be persisted in three or six months after the disease has disappeared to prevent a relapse. He uses fumigations, also, much on the same plan as Mr. Langston Parker, but thinks a spirit-lamp does not give out sufficient heat. (p. 261.)

Phagedenic Chancre.—Iron is the remedy, its effects are almost magical. It is much used by M. Ricord. The following is the best mode of giving it. Potassio-tartrate of iron, one ounce; water six ounces. Mix. Two table-spoonfuls three times a day. (p. 262.)

Tertiary Symptoms.—Give the iodide of potash in *large doses*, which will benefit when small ones are of no avail. (Mr. W. Acton, p. 263.)

AFFECTIONS OF THE EYE AND EAR.

Corneitis.—In the treatment of diffuse opacity of the cornea from corneitis, by stimulants, Dr. Jacob says, solutions of nitrate of silver, sulphate of copper, sulphate of zinc, or the combination called lapis divinus, will perhaps answer; but he uses a solution of iodide of potassium, ten grains to the ounce of water, or he touches the surface with a camel-hair pencil, previously dipped in water, and brushed two or three times on soap. (p. 357.)

Speculum Auris.—[An improvement on Mr. Wilde's speculum is described by Mr. J. C. Forster, p. 357.]

MIDWIFERY AND DISEASES OF WOMEN.

Hemorrhage, *Uterine.*—Mr. J. Griffith brings again into notice the great value of oil of turpentine in uterine hemorrhage. He says the most convenient way of giving it is ʒj of turpentine to ʒss of oil of sweet almonds as a draught, and repeated in five minutes if the symptoms are urgent. (p. 270.)

Lactation.—In cases of child-birth where the appearance of milk is delayed, a decoction is made by boiling well a handful of the white Bofareira (Ricinis Communis of botanists) in six or eight pints of spring water. The breasts are bathed with this decoction for fifteen or twenty minutes. Part of the boiled leaves are then spread thinly over the breasts, and allowed to remain until all moisture has been removed from them by evaporation, and probably, in some measure, by absorption. This operation is repeated at short intervals, until the milk flows upon suction by the child, which it usually does in the course of a few hours. If the milk is required to be produced in the breasts of women who have not given birth to or suckled a child for years, the mode of treatment is as follows:—A similar decoction is made, and it is poured, while yet boiling, into a large vessel, over which the woman sits so as to receive the vapour over her thighs and generative organs, cloths being carefully tucked around her, so as to prevent the escape of the steam. In this position she remains for ten or twelve minutes, or until the decoction cooling a little, she is enabled to bathe the parts with it, which she does for fifteen or twenty minutes more. The breasts are then similarly bathed and gently rubbed with the hands, and the leaves are afterwards applied to them in the manner described. These operations are repeated three times during the first day, on the second the process is repeated as to the breasts three or four times, on the third day the whole process is repeated. A child is now put to the nipple, and, in the majority of instances, it finds an abundant supply of milk. In the event of success not following, the treatment is continued for another day; and if there be still want of success, the case is abandoned. (Dr. J. O. M'William, p. 316.)

Oxytoxic.—The administration of the Indian hemp seems markedly and directly to increase parturient action, and Dr. Churchill states, that it possesses powers similar to those of the ergot of rye in arresting hemorrhage, when dependent upon congested states of the impregnated uterus. (Prof. Simpson, p. 316.)

Placenta Prævia.—If the os uteri is not dilated plug the vagina accurately, to produce a coagulum and stay the flooding, to save the child, to prevent the powers of the mother being exhausted by loss of blood, and to favour the dilatation of the os. As soon as the state of the os allows, introduce the hand immediately, separate sufficient of the attachment of the placenta to the uterus to allow the hand to pass, and turn and deliver. We believe that where the cessation of hemorrhage takes place from the separation of the placental attachment, the placenta being still left in situ, as advocated by Professor Simpson, it is owing to the placenta forming a plug upon the uterine orifices. For the arguments in the defence of the use of the plug and the explanation of its action, see p. 268. (Mr. W. Braithwaite.)

Sponge Tents.—An improvement upon Dr. Simpson's method of making sponge tents has been introduced, which consists mainly in not steeping the sponge in a solution of gum; and the advantages of this method are, that "they are made with much greater facility, their being thus compressed into a much smaller compass, and that the expansion of the tents is equally gradual, never requiring the aid of tepid water injections, the moisture of the surrounding parts being quite sufficient." (Mr. C. Coates, p. 306.)

Sterility.—Dr. E. Williams has described a Japanese remedy for sterility. The tree is one of the order of the Ternstromaceæ of Jessieu, with leaves somewhat larger than those of the congou tea, emitting an odour when bruised resembling pulegium and sabina. The mode of preparation is to take a quantity of the leaves, macerate them in as much rice spirit as will just moisten them, for six hours; then express, and give about a teaspoonful every hour, and two or three doses will invariably bring on the menstrual secretion, which can be maintained by a dose or two daily, for any length of time. (p. 320.)

Uterine Neuralgia.—Apply blisters to the hypogastric region, cauterization of the cervix, narcotic injections, with absolute rest and general treatment. (M. Valleix, p. 307.)

Warty Excrescences.—Mr. T. W. Nunn, acting on the principle of Dr. Arnott, of using congelation as an anæsthetic agent, has recently applied little wedged-shaped pieces of ice to the necks of large warty growths depending from the labia minora, till they became blanched and cold; and he then removed a great many of them with a single stroke of the knife, without causing the patient any but very slight pain. (p. 314.)

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